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From the editorial office

Customarily, the turn of the year is also a time for sober reflections. When limiting to the journal's profile, it is worth making a few observations on the financial system. A synthetic review of debates held in the financial community allows us to conclude that throughout almost the entire year 2021, the subjects of the impact of the COVID-19 pandemic on the functioning of socio-economic systems, the issue of slowdown or growth rate, taking into account perturbations in global supply chains, as well as the interventions by the public authorities to mitigate the pandemic effects, were dominant in the country and in the world. The subject of the so-called "Swiss franc loans", and especially in the fourth quarter – lack of expected aid funds from the EU and a sharp inflation increase, were the top topics in Poland. Problems related to global climate threats were also not ignored, mainly in terms of the system – the poorer the region or continent, the greater the threats.

In the globalized world, it is impossible to ignore the issue of geopolitical perturbations affecting the world economy. One can mention here, amongst others, conflicts between China and the USA, Russia's assertive policy towards its near and distant foreign countries, and finally tensions within the European Union. It could even be argued that superpower policy aims to shape a new global balance infrastructure. Against the background of the ongoing processes, the Polish banking sector remained stable, and the financial results turned out to be better than the pessimistic forecasts. On the other hand, against the background of the sharp change in the NBP interest rate policy in connection with the record-breaking for two decades inflation, the risk of a dynamically expanding portfolio of housing loans without an appropriate long-term financing structure is growing. All this means that especially the youngest generations of financial market participants are facing previously unknown challenges that they will have to face. To make matters worse, the COVID-19 pandemic seems to be never ending, and it is constantly surprising us with new problems. In a word – begins the year in which it will be necessary not only to properly address, but also to solve socially and financially difficult problems.

Going beyond the scope of the Safe Bank Journal industry, it is also worth noting that the dominant trend is still solving problems, even crises in the world, taking into account paradigms from the increasingly distant past, which are inadequate

for the present day. Given the above-mentioned conditions, the question arises whether the limit of usefulness of these paradigms is not exceeded and whether not to boldly and prudently formulate and implement an innovative approach based on greater integration of social and natural sciences. One can even find proposals for a revision of the mainstream economics paradigm for the adaptation of the global socio-economic system to the concept of sustainable development, symbolically corresponding to the principles of thermodynamics (also known as the Bagel Economy). Since every human activity requires energy transformations leading to an irreversible increase in the entropy of the system, which we experience, among others, in the materialization of ESG risk.

In the last issue of the Safe Bank in 2021, in the section *Problems and Views* we publish five articles, four of which in various aspects deal with the issues of the relationship between the COVID-19 pandemic and the functioning of the financial system in the scale of the European Union and its member states, with particular emphasis on the Polish banking sector. The fifth article outlines the prospects for the development of European covered bonds. In the *Miscellanea* section, we present the 8th edition of macroeconomic challenges and forecasts developed by experts from the European Financial Congress. The issue is complemented by a discussion on Paweł Niedziółka's monograph entitled *Green (r) evolution in Polish banking*.

With wishes of interesting reading and a pleasant 2022.

Editor in Chief
Jan Szambelańczyk

Problems and Opinions

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Macroprudential capital requirements in the European Union during the COVID-19 crisis

Abstract

The article tackles the issue of macroprudential policy in the European Union during the COVID-19 pandemic, from the end of 2019 to mid-2021. The main purpose of the analysis was to compare changes in the restrictiveness of macroprudential requirements (capital buffers) using various restrictiveness measures (capital requirement, excess capital buffer, bank lending capacity). Using quantitative and qualitative data analysis, the main reasons for changes in the restrictiveness of macroprudential policy have been identified. It has been shown that the reduction of the regulatory stringency resulted to a bigger extent from improved capital position of banks than from a lower capital requirement. The analysis has also indicated that among the EU countries, capital requirements for banks in Poland were loosened the most during the pandemic.

Key words: European Union, macroprudential policy, COVID-19 pandemic, capital requirements, restrictiveness

JEL codes: E51, G18, G21, G28

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Makroostrożnościowe bufory kapitałowe banków w Unii Europejskiej w trakcie kryzysu pandemicznego

Streszczenie

Artykuł poświęcony jest polityce makroostrożnościowej w gospodarkach Unii Europejskiej w okresie pandemii COVID-19, od końca 2019 do połowy 2021 roku. Głównym celem analizy było porównanie zmian restrykcyjności wymogów makroostrożnościowych (buforów kapitałowych) z wykorzystaniem różnych miar restrykcyjności (wymóg kapitałowy, nadwyżkowy bufor kapitałowy, potencjał do ekspansji kredytowej). Stosując metody ilościowej i jakościowej analizy danych zidentyfikowano główne przyczyny zmian restrykcyjności polityki makroostrożnościowej, wykazując że jej ograniczenie wynikało w większej mierze z dążenia do odbudowy pozycji kapitałowej banków niż z obniżenia wymogu regulacyjnego. Analiza pokazała ponadto, że spośród badanych państw wymogi kapitałowe dla banków w Polsce w trakcie pandemii zostały poluzowane najbardziej.

Słowa kluczowe: Unia Europejska, polityka makroostrożnościowa, pandemia COVID-19, wymogi kapitałowe, restrykcyjność

Introduction

The COVID-19 pandemic and the accompanying processes and crisis phenomena were the first real test for macroprudential capital requirements (conservation buffer, countercyclical buffer, systemic risk, and systemically-important institutions – global or other)[1] which, according to the assumptions, were intended to reduce risky banking activities and prevent the building up of systemic risk. The introduction of national sanitary regulations and the reduction (voluntary or compulsory) of mobility of people, or even lockdown, have led to a sudden and unprecedented breakdown of economic activity and have resulted in a loss of financial continuity for many companies and a threat to sustainable employment of workers. It was only possible to stabilize the situation after an extensive and extremely rapid (compared to historical experiences) intervention of governments with the use of economic policy instruments (monetary and fiscal). However, these interventions did not prevent recession, the scale of which could be compared to the one that occurred at the turn of 2008 and 2009. However, they have allowed the financial sector to be protected from the crisis, which seemed very likely after monthly perturbations initiated at the end of February 2020.

As part of the stabilization policy, among many, the macroprudential policy has been loosened. In the European Union, the first steps were already taken in March 2020, whereby the capital and liquidity requirements were loosened in most Member States. Banks were also motivated to restore their excess capital during the period of limited demand for credit and under the protective umbrella of economic policy.

[1] The so-called "Pillar 2 Requirements" are considered micro-prudential at work due to their determination on the basis of stress-tests for individual institutions.

Consequently, from a regulatory point of view, five quarters after the outbreak of the pandemic, the capital position of most banks was better than in February 2020, i.e. before the pandemic.

The objective of the presented analyses was to identify the reasons of changes in restrictiveness of the macroprudential policy in the European Union in the face of the pandemic crisis. Various measures of restrictiveness (capital requirement, excess capital buffer, bank lending capacity) and their evolution during the pandemic were compared in the analyses carried out using quantitative and qualitative methods.

1. Review of literature regarding the measure of restrictiveness of macroprudential policy

The assessment of effectiveness of macroprudential policy usually involves the examination of impact of prudential instruments on bank lending, the level of indebtedness and the price of assets (including, in particular, real estate) or the interest rate on loans. The specificity of prudential instruments results in the analysis being mainly based on discrete (discontinuous) data and sometimes zero-one data. This is, among many, due to the characteristics of the prudential tools used, the multiplicity and diversity of which in each country results in a limited comparability and hence the assessment of restrictiveness. Early studies used single or aggregate fictitious variables to assess the impact of implementation or change of a specific regulatory instrument. Examples of works with single variables are: Lim, Columba, Costa, Kongsamut, Otani, Saiyid, Wezel and Wu (2011), Tovar, Garcia-Escribano and Vera Martin (2012) as well as Arregui, Benes, Krznar, Mitra and Santos (2013). Analyses with aggregate fictitious variables were conducted by Kuttner and Shim (2016) if more than one instrument was changed or introduced during the period considered. Crowe, Dell'Ariccia, Igan and Rabanal (2013) used the case study method to assess the impact of selected macroprudential variables on the real estate market. Claessens, Ghosh and Mihet (2013) and Geršl and Jašová (2014) used a binary approach to determine the period during which a given regulation was in force.

Vandenbussche, Vogel and Detragiache (2015) introduced more sophisticated measures of restrictiveness of macroprudential policy. They have not only distinguished the direction of changes in macroprudential instruments, but also assigned a degree of restrictiveness to them. An example was the introduction of the LTV ratio at the level of 60% as more restrictive than the LTV-100% ratio. Thus, they recognised changes in the level of bank capital requirements, differentiating them according to the size of the change in the total requirement measured in percentage points.

The discretion of data reflecting macroprudential policy was one of the most important factors hampering the analysis of the impact of changes in prudential regulations on the financial sector. The most common solution to this problem was the creation of aggregated (composite) measures involving far fewer or more

related instruments (cf. Ostry, Ghosh, Chamon and Qureshi (2012), Zhang and Zoli (2016) and Bruno, Shim and Shin (2017)). The structure of these macroprudential policy indexes quickly became popular. They were used, among many, by Fendoğlu (2017), Cerutti, Claessens and Laeven (2017), and Akinci and Olmstead-Rumsey (2018), who additionally developed separate indexes for loosening and tightening macroprudential policy), Cizel, Froost, Houben and Wierts (2019), differentiated pricing and quantitative instruments in their study in order to solve the problem of boundary conditions, since the fictitious variables available in most databases did not allow for an assessment of the scale of regulatory actions.

Kuttner and Shim (2016) stressed that the use of binary rather than numerical variables in assessing the effectiveness of macroprudential policy is a simplification, but results from a high heterogeneity of data (cf. also Carreras, Davis and Piggott (2018)). This is an important statement, since even the use of very similar prudential instruments, such as DTI (debt-to-income ratio of the debtor) and LTV (loan-to-value ratio) ratios, cannot be compared easily (due to different types of properties, types of customers, lenders, etc.). Lee (2013) analysed the case of South Korea, where the LTV and DTI ratios were different due to the type of property, its location, maturity of the loan, type of financial institution that granted it, or even the debtor's marital status. The problem was also addressed by Tillmann (2015) and Lee, Asuncion and Kim (2016), who used the econometric modelling (vector autoregression enhanced by the use of qualitative variables, Qual VAR) to convert binary variables with macroprudential shocks to continuous data. Zhang and Tressel (2017) mapped macroprudential instruments, assigning them to factors influencing the change in the criteria of granting credit. For example, they did not use fictional variables for the LTV requirements, but they analysed changes to these requirements on the basis of analyses by the chairmen of the credit committees (*Bank Lending Survey*). In addition to using the traditional macroprudential policy index, Dumičic (2018) directly used the values (in percentage or percentage points) of the minimum reserve requirement as well as the LTV and DTI ratios. Some research used changes in variables following previously imposed requirements, such as the dynamic provisioning mechanism (Jiménez, Ongena, Peydró and Saurina 2017) or the LTV ratio (Richter, Schularick and Shim 2019).

2. Evolution of research on capital requirements of banks

A growing standardization (through the successive Basel Capital Agreements) and the use (due to the introduction of Basel III) of capital buffers creates a promising field of research the object of which is assessing the impact and effectiveness of prudential tools directed at the supply side of banks. In view of the existence of capital requirements, each bank must condition the decisions on the expansion of its business by the level of capital held (own funds). As each bank must, when granting a credit, set aside a sufficient part of these funds (subject to the capital requirement, but also to an independent decision on possible internal buffers), it appears that

weaker institutions grant fewer credits. Altavilla, Boucinha, Holton and Ongena (2018) show that a lower rate of credit expansion of weaker banks is due both to the reduced supply and demand for credit, which depends, among others, on their risk profile and the financing structure. Gambacorta and Shin (2018) indicate that the level of equity is an important factor defining both the cost of financing and the dynamics of bank lending. In their view, banks with larger equity are characterized by faster credit expansion due to the possibility of obtaining cheaper financing. The European Banking Authority (2015) has established in the pan European banking sector survey that a higher level of capital has a significant positive impact on the supply side of bank lending.

Capital requirements have been at the centre of research for many years (cf. Bernanke and Lown (1991), who pointed to the relationship between equity, assets and credit expansion, suggesting that the decrease in banks' capital could have aggravated the 1990 recession in the USA; Hancock and Wilcox (1993) showed that bank lending in 1990 slowed down due to the insufficient level of equity in banks, which made some of them reduce the volume of loans to meet capital requirements). Heid, Porath and Stolz (2003) showed that the response of banks to changes in capital requirements depends on their (excess) capital buffers, i.e. the difference between the capital adequacy ratio and the regulatory requirement. This approach was widely used even before the global financial crisis (cf. Fonseca, González and Pereira da Silva (2010), who have carried out a very detailed review of literature from that period), because (at a fixed level of requirements which was in force at that time) it enabled the assessment of the (relative) binding force of the regulation.

The use of capital ratios as a determining factor for bank lending took place after the global financial crisis of 2007–2009. Aiyar, Calomiris and Wielądek (2014) measured the impact of capital requirements changes on credit expansion of banks. The approach based on the capital requirement or capital adequacy ratio has been changed relatively quickly to the one which places the focus on excess capital above the regulatory requirement (cf. among many Berrospide and Edge (2010), Borio and Gambacorta (2017), Catalán, Hoffmaister and Harun (2017) and Gambacorta and Shin (2018)). Kapuściński (2017) provides an example of use of the second approach in the Polish environment. De Jonghe, Dewachter and Ongena (2020) did not directly use the excess capital, but they modelled various measures of credit expansion, while taking advantage of the requirement and the capital adequacy ratio. Finally, Imbierowicz, Löffler and Vogel (2021), in addition to the excess capital, used the relation between risk-weighted assets to total assets. They stressed that using such an approach continued the observation that banks with a lower average risk weight are less exposed to changes in capital requirements. All the above-mentioned measures aim at improving the comparability of data not only between different banks, but also between different jurisdictions, which may be characterised by different levels of capital requirements, structure of credit demand (and thus an average risk weight depending on the type of credit that is dominant in the banking portfolio).

3. Data characteristics and research methodology

The study of the restrictiveness of macroprudential policy in the European Union was carried out using four variables: capital requirement, capital adequacy ratio, (excess) capital buffer and the bank lending capacity measured both in absolute (EUR billion) and relative (as a percentage of assets) terms[2]. The conclusions drawn, in particular in terms of excess capital and bank lending capacity, are based on the capital adequacy of banks to regulatory capital (rather than internal capital), which means that they do not capture banks' internal decisions to maintain a minimum (used only in extreme situations) excess of own funds above the regulatory requirement.

The analysis of the combined buffer requirement is limited to macroprudential instruments. This means that it excludes the so-called Pillar 2 buffers, which relate to the so-called supervisory discipline, and hence they are determined on a case-by-case basis for a given institution based on their specific risks (micro approach). The analysis covered data for 27 countries of the European Union. The values of capital requirements/buffers are derived from documents published by the European Systemic Risk Board[3], while capital adequacy, balance sheet and risk weight measures are derived from the database of the European Central Bank (ECB Statistical Data Warehouse). Table 1 describes the data used and their sources.

Table 1. Variables used in the study and sources of information

Variables	Source of information
Own funds for a given institution	Consolidated financial statements
Own funds for the sector	Own calculations based on asset, CAR and average risk weight data (all from the ECB)
Loans and securities	ECB
Exchange rates	stooq.pl
Average risk weight of assets	ECB
Total assets	ECB
Capital adequacy ratios	ECB
Capital buffers requirements	ESRB

Source: Own study.

[2] According to the methodology proposed by Czaplicki (2021), this is the quotient of the excess capital and the total capital requirement.

[3] "Overview of national capital-based measures" published quarterly on the ESRB website presenting national supervisory activities (https://www.esrb.europa.eu/national_policy/html/index.en.html), as well as the notification of local authorities conducting macroprudential policy.

Due to diversified values of the combined buffer requirement, not only for different economies but also for individual banks, data aggregation at national level has been carried out in order to set a requirement for individual banking sectors. To this end, data for 197 banks have been collected (banking groups from the European Union), which were included in the ESRB database. At the same time, if, during the analysis period, further mergers or acquisitions between banks in the base took place, historical data were adequately aggregated to obtain a uniform set of historical data. Table Z1 in the Annex contains the list of banks under analysis.

Data on capital requirements for particular banks in the analysed country were dominated by their shares in the total own funds of the sector concerned[4]. As a result, the capital requirement for the domestic banking sector is a weighted average of the requirements for the banks operating there. In contrast to the dominant form of analysis (e.g. 10.5–12.0%), the approach used allows a more accurate analysis of restrictiveness by indicating a single point measurement.

The study also analysed the reasons for the change in restrictiveness of macroprudential policy. This was possible thanks to its decomposition. Firstly, a modification of the capital requirement and a change in the level of capital adequacy were identified as two main reasons for the volatility of both the excess capital and the potential for expansion of banks' assets. The reasons for changes in capital adequacy were then analysed, identifying the volatility of own funds, the size of banks' assets and their average risk weight. On the one hand, this approach allows a more precise indication of the immediate causes of changes in policy restrictiveness, provided that the measure of restrictiveness is not a requirement alone, but a degree of "nuisance" for the regulated institutions. On the other hand, this approach does not correspond to the highest possible degree of detail. In particular, changes in risk weights may have resulted either from supervisory and regulatory decisions (such as the introduction of CRR Quick Fix) or from bank decisions on credit and investment policy (leading to a change in the structure of assets and hence their average risk weight). In the case of own funds, due to the lack of available data, it was not possible to identify the extent to which their change was influenced by bank profits or losses, possible share issues or subordinated bonds, or other factors.

There are two ways in which the decomposition of changes in capital capacity to the expansion of banks' activities in the European Union has been performed. The first was performed using the harmonized measurement in euro and the second using values in national currencies. The latter made it possible to avoid distortions due to, for example, weakening of the exchange rate, despite the increase in nominal assets or own funds.

[4] For example, if we have a sector consisting of bank A and B with requirements of 12% and 15% respectively and own funds of EUR 1 billion and EUR 3 billion, then bank A has a weighting of 25% and bank B 75%, therefore, the (weighted) requirement for the whole sector is 12% x 25% + 15% x 75%, meaning 14.25%.

4. Macroprudential policy in the European Union during the COVID-19 crisis

The COVID-19 pandemic and the related crisis were the first opportunity to review the assumptions underlying macroprudential policy conducted in earlier years. This concerned in particular the widespread reduction of capital buffers which mitigated the impact of the crisis on bank lending. Casanova, Hardy and Onen (2021) analysed different ways of increasing bank lending and confirmed the positive impact of increasing bank lending capacity. Banks which improved their capital position at the beginning of the pandemic showed a higher increase in the volume of loans in the following quarters of 2020. Based on a sample of 133 large banks, Hardy (2021) showed that the restrictions on the payment of dividends resulted in an increase of the capital base in 2020 and translated into a higher bank lending. Dicanio and Montesi (2021) analysed the aggregated data for France, Spain, Germany, the United Kingdom, Italy and the USA, comparing the potential for absorption of bank losses (capital surplus against the requirement taking into account the increase in potential losses due to the pandemic) before the global financial crisis in 2007 and the pandemic crisis in 2019, and the impact of reductions on bank lending capacity. They concluded that banks had much higher buffers before the pandemic crisis, which allowed them to increase their assets by 10–20% while maintaining their potential to absorb possible losses related to the crisis. On the other hand, the Financial Stability Board (2021, p. 10) concluded that banks mostly increased their excess capital during the first months of the pandemic. Riksbank (2020) estimated that the reduction in capital requirements by the Swedish supervisor at the beginning of the pandemic would release approx. SEK 900 billion of credit capacity of Swedish banks.

The analyses of Budnik, Dimitrov, Groß, Jancokova, Lampeg, Sorvillo, Stular and Volka (2021) show that the supervisory, regulatory and public authorities (in particular the loan guarantees) undertaken in the first half of 2020 have allowed to keep the private non-financial sector loan portfolio at the level of approx. 5% higher (including 12% higher for non-financial enterprises) than would be the case in the absence of this intervention. In addition, the intervention measures had a positive impact on both the level of non-supported loans and the profitability the banks. Avezum, Oliveira and Serra (2021) have demonstrated that the loosening or abolition of capital buffers (in particular the countercyclical systemic risk buffer) had a positive impact on bank lending addressed to households (mainly mortgage loans) and small businesses. Dobrzańska (2020) and Radek (2021) carried out a review of micro- and macroprudential tools used or changed during the pandemic in the European Union.

Czerniak, Czaplicki, Mokrogulski, Niedziółka and Szelągowska (2021, pp. 289–290) estimated that "the change in capital requirements, together with the increase in capital adequacy ratios in the banking sector allowed to increase the credit capacity of (banks in the countries of Central and Eastern Europe belonging to the European Union) by 41.7%, a total of EUR 148,7 billion (in 2020)". These authors also examined the difference between the degree of restrictiveness of capital regulations in the group of 11 countries in the region of Central and Eastern Europe and concluded

that banks in the region "were well equipped to support the government in anti-crisis measures, and the credit capacity was between 33.5% (Slovakia) and 54.9% (Estonia) of the value of the volume of the already granted credits."

5. Results of research on the change of restrictiveness of capital requirements in the EU

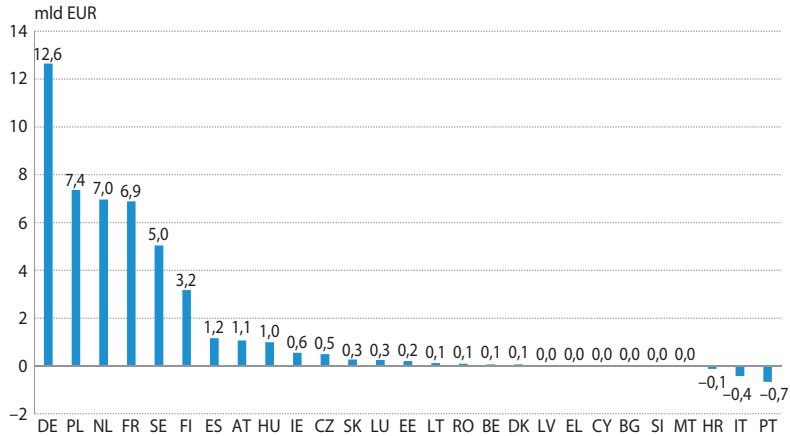
The source literature lacks a comprehensive analysis of changes in the capital requirements of banks during the COVID-19 pandemic crisis. Therefore, the study attempts to fill this gap by an empirical analysis of changes in macroprudential capital requirements and bank capital adequacy in the 27 Member States of the European Union over the period from the end of 2019 to September 2021.

The global spread of the coronavirus pandemic and the resulting recession has hit the European Union economy at an unprecedented speed, which has led to an immediate response of many governments and central banks in the scope of monetary and fiscal policy, but also macroprudential policy. In France, Ireland and Lithuania, the countercyclical buffer has been reduced to zero. In Belgium, Germany and Slovakia, the previously announced increases in this buffer have been cancelled (Slovakia subsequently reduced the buffer to 1%). The Estonian and Finnish authorities have abolished the systemic risk buffer, and in the Netherlands the risk buffer has been reduced from 3% to 1.5%–2.5% depending on the institution. Buffers of other systemically important institutions (OSII) in Cyprus, Finland, Lithuania and the Netherlands have also been reduced or the period for the implementation of the pre-planned requirements has been extended (Portugal and Greece). In addition, the European Central Bank (2020) encouraged banks in the euro area to use available capital buffers, including Pillar 2 buffer[5]. Supervisory and regulatory authorities have taken steps to reduce the burdensome capital requirements for banks also outside the euro area. The Czech Republic has halved its countercyclical buffer, from 1.75% to 0.5%. In Denmark and Sweden, this buffer has been completely abolished. In Bulgaria, the previously adopted increase was suspended. In Poland, the systemic risk buffer was *de iure* abolished, which in fact meant its reduction from 3% to 0%. In Hungary, the buffers of other systemically important institutions have been reduced to zero. By 30 June 2021, all macroprudential measures taken in the euro area countries have released EUR 34.0 billion of own funds and EUR 48.1 billion across the European Union.

The analysis of Chart 1 shows a very large variation in the capital freed up in the banking sectors of EU countries. From this point of view, a very high position of the Polish banking sector is worth highlighting, where almost 59% of the capital released in Germany has been released, distancing substantially the remaining Central and Eastern European countries from the EU Member States.

[5] This issue was not directly used in the study under consideration in this article.

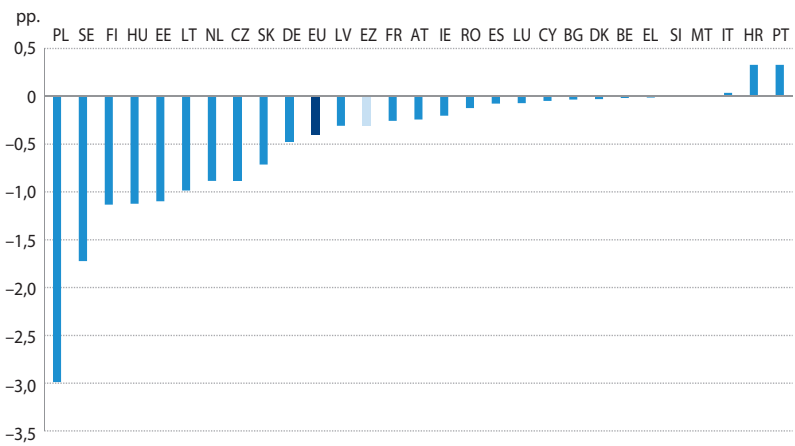
Chart 1. Released own funds of banks in EU countries following a reduction in macroprudential requirements (As of 30 June 2021)



Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

The values in Chart 1 are derived from both changes in the regulatory requirement and the size of the banking sector concerned. Chart 2, however, illustrates a relative change in the level of the combined buffer of macroprudential requirements in the EU countries between March 2020 and September 2021. This parameter has been mostly reduced in Poland by almost twice the percentage points for Sweden taking the second position and almost eight times for the EU average.

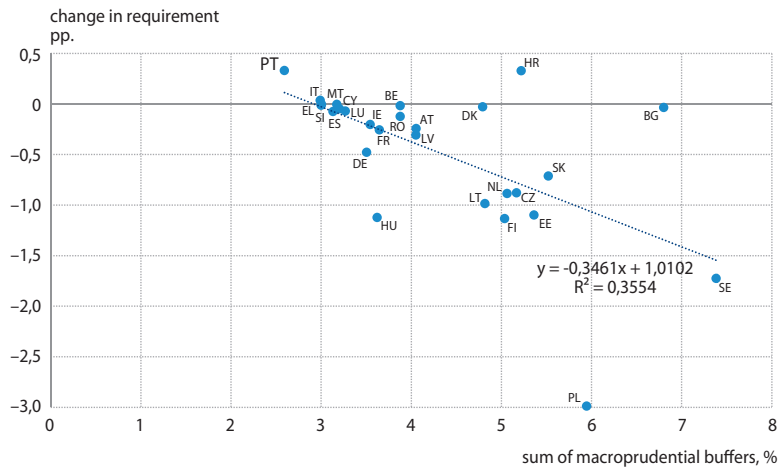
Chart 2. Change in the total capital macroprudential buffer requirements of EU countries between March 2020 and September 2021.



Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

Charts 1 and 2 show that the average capital requirement for the sector has not decreased in all EU countries, which did not allow the banks to release own funds, even though individual instruments have been reduced. In Italy, this was due to increases in the O-SII capital buffers for the largest banks at the end of 2020, in Portugal due to an increase in the size of banks with higher capital requirements (leading to an increase in the average requirement) and in Croatia due to a change in the calculation of the requirement (at the outbreak of the pandemic, the higher of the O-SII buffer or the systemic risk was taken into account)[6]. What is interesting, the impact of the reduction in the countercyclical buffer in Ireland at the beginning of Q2 2020 was greater than the subsequent (Q4 2020 and Q2 2021) increases in buffers of other systemically important institutions. In addition, it is worth pointing out that decisions to reduce requirements have often been justified by space for such action. The greater the pre-pandemic macroprudential requirement (above 8%), the greater the space for its reduction during the pandemic crisis. Chart 3 illustrates that many macroprudential supervisory authorities have made use of this possibility. It also shows that in countries where the sum of macroprudential buffers was close to the level of the conservation buffer (2.5%), supervisors refrained from amending decisions (minor changes to the requirement result from shifts in the sector structure, which are a derivative of the methodology adopted in the study[7]).

Chart 3. Pre-pandemic macroprudential buffer and the scale of decrease in capital requirement during the pandemic



Note: dots in the graph represent countries of the European Union.

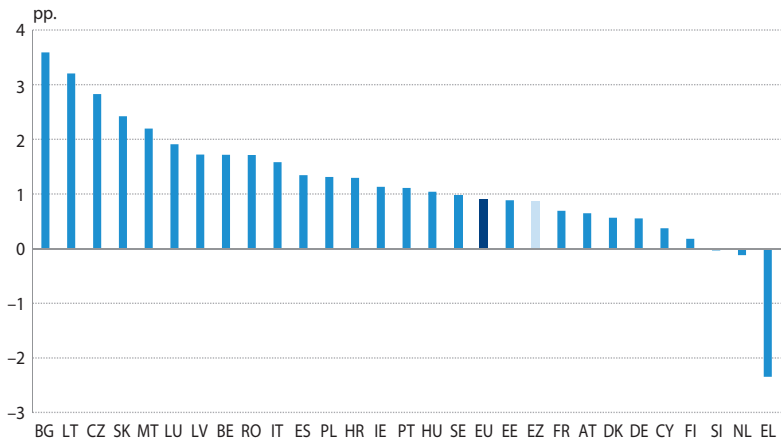
Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

6 Since the end of 2020, their values have been added up, which for some banks has coincided with a reduction of the systemic risk buffer.

7 The requirement, which in the study is calculated for each country, is the weighted average of the requirements for individual institutions operating in them, and therefore (for example) if the size of banks with high individual requirements increases and is stable for the remaining ones, the average requirement for the whole sector is also increasing. This is a derivative of the greater importance of these institutions in the local banking sector.

The increase in the amount of own funds (e.g. as a result of retained earnings) and the decrease in the average risk weight of assets (resulting from a change in the structure of the assets toward those less risky)[8] have reduced the negative impact of the increase in the balance sheet total on the capital adequacy ratio. Chart 4 shows that the capital adequacy ratio (CAR) has increased almost in all EU countries apart from Slovenia, the Netherlands and, above all, Greece (EL), where it has decreased by more than 2 pp.

Chart 4. Change in capital adequacy in the European Union countries between 31 December 2019 and 30 June 2021



Source: Own study based on ECB data.

The compilation of changes in macroprudential requirements and capital adequacy measures shows that, between the beginning of 2020 and the end of June 2021[9], the banks' excess capital did not increase only in Slovenia, the Netherlands and Greece. Chart 5 presents a summary of changes of this excess as per EU countries, with a breakdown of its sources for changes in capital requirements and capital adequacy ratio.

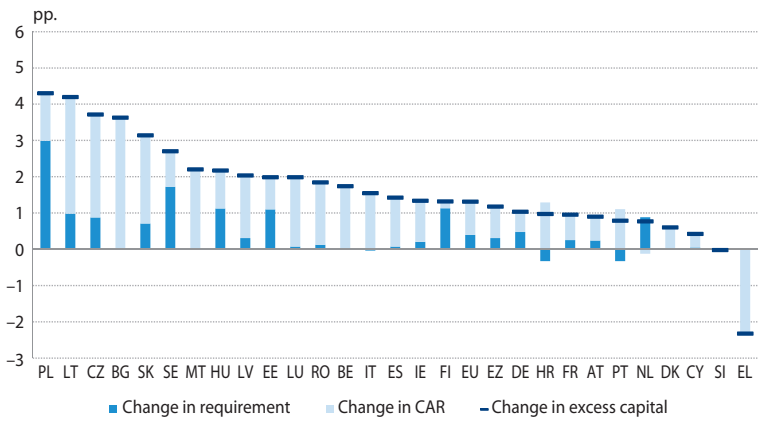
The analysis of Charts 2, 4 and 5 indicates that despite the decrease in capital adequacy measures in the Netherlands, the cumulative reduction of the requirement has allowed to increase the excess capital. This means that in the banking sector, regulatory actions have freed up additional capital to credit expansion or absorption of pandemic losses. Quite the opposite was observed in the case of Italy, Portugal and Croatia. Despite an increase in the requirement, the improvement in adequacy

[8] Apart from Luxembourg and Denmark, where the average risk weight of assets has increased, but the assets themselves have decreased.

[9] At the time of the study, more up-to-date balance sheet data were not available in the ECB database.

measures has resulted in an increase in the excess capital. However, in Greece, the decrease in the average capital adequacy ratio was large enough that the reduction in the regulatory requirement could only reduce its negative effects. It is worth pointing out that the sole drop in the requirement in Greece was almost unnoticed, as in Slovenia, where it also did not offset the decline in capital adequacy measures in the banking sector. In turn, in the case of Bulgaria, capital requirements have in principle not changed (for some institutions they have been slightly strengthened, for others the obligation to maintain the OSII capital buffer has been abolished), but the measure of capital adequacy has increased most from all EU countries, which moved Bulgaria right behind the EU's podium in terms of increase in excess capital in the period under consideration.

Chart 5. Change in the excess capital of banks in the European Union countries between 31 December 2019 and 30 June 2021



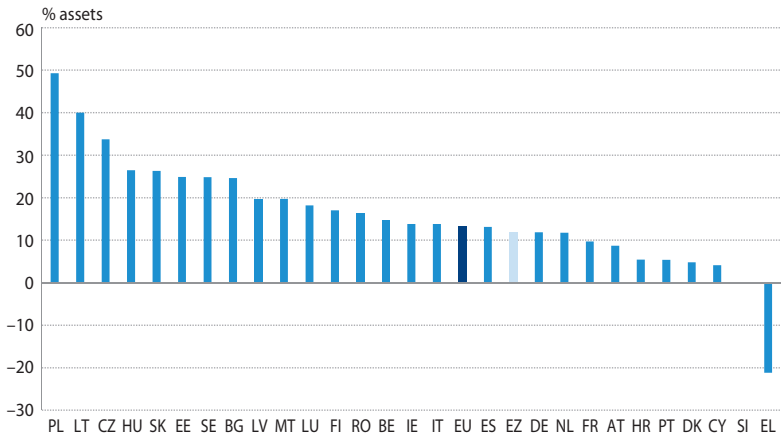
Note: Values greater than zero mean that: the capital requirement has decreased (i.e. *ceteris paribus* the excess has increased) or the capital adequacy ratio has increased (i.e. *ceteris paribus* the excess capital has increased). The change in excess capital is the sum of the effects of the two components analysed.

Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

The analysis of the results also leads to other interesting conclusions. Although Finland has experienced the greatest fall in requirements in the euro area (and the third largest in the Union), it is not even in the upper half of countries with the largest increase in excess capital. Sweden, on the other hand, which was only behind Poland in terms of reduction of requirements, is only on the sixth place in the case of excess buffer. This can be interpreted in such a way that the absolute measure of restrictiveness of macroprudential policy in the form of a capital requirement is not suitable for comparisons of international or individual financial institutions. Excess capital (excess buffer) proved to be a much better measure. However, it is not without defects either. The banking sector may be characterised by a greater excess,

although its bank lending capacity will be much smaller. This depends mainly on the level of the requirement in a given country and the lending policy of the banks (e.g. structure of bank lending and a method of measuring risk that translates directly into the average risk weight of assets). Chart 6 includes a comparison of capacity changes to bank lending as a percentage of the current exposure to risk (i.e. approximately a percentage of the total assets[10]).

Chart 6. Change in capital capacity* for the expansion of banks in EU countries between 31 December 2019 and 30 June 2021



* By how many percent may increase the assets with the excess capital held and assuming their average risk weight is maintained.

Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

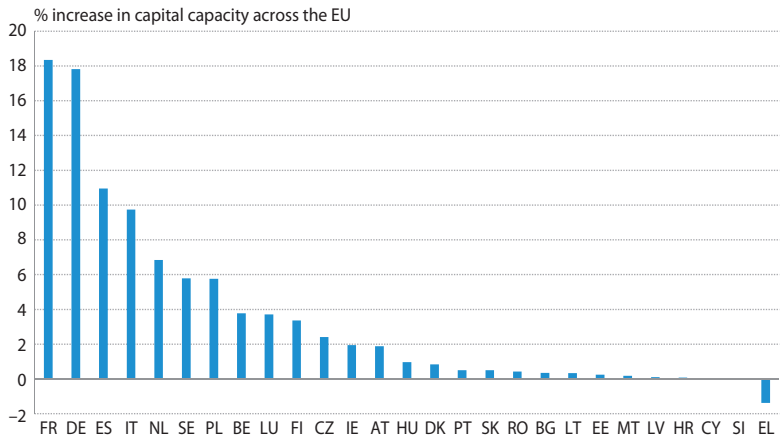
Chart 6 confirms that the conclusions of the analysis of capital potential for bank expansion and bank surplus capital (or sector) are similar, but do not need to be the same. For example, in Hungary, the macroprudential policy was more liberalized during the COVID-19 pandemic than in Bulgaria (but also in Sweden or Malta), despite the fact that the excess capital increased more in that country. In addition, the proportions of particular measures have changed. In the case of Lithuania, in the period under consideration, the excess capital increased by 4.2 pp, meaning more than twice than in Estonia (2.0 pp), but the potential for expansion increased by only 60.8% more than the latter (respectively 40.0% against 24.9% of space for the increase in assets).

Generally, throughout the European Union, the loosening of macroprudential requirements has freed additional space in banks to increase their assets by 4.1% or EUR 1.424 trillion, while the increase in capital adequacy has added 9.3% of assets

[10] Approximately because some risks, such as operational or market ones, are not always directly proportional to the size of the balance sheet total.

(EUR 3.234 trillion). Both of these factors have led to a reduction of restrictiveness of macroprudential policy of around EUR 4.659 trillion, which has increased the potential for the expansion of the balance sheet of the Union banking sector. In the euro area, these values are 3.1% (EUR 0.992 trillion), 8.8% (EUR 2.769 trillion) and EUR 3.760 trillion, respectively. This shows that the banking sector of non-euro area countries has a total of only 9.2% of banking assets, but was responsible for 19.3% of the EU-wide capital capacity increase. Chart 7 documents that Sweden, Poland, Hungary and Denmark have mostly been behind this (15.8% in total).

Chart 7. Contribution to the development of capital capacity for the expansion of banks in the European Union countries between 31 December 2019 and 30 June 2021

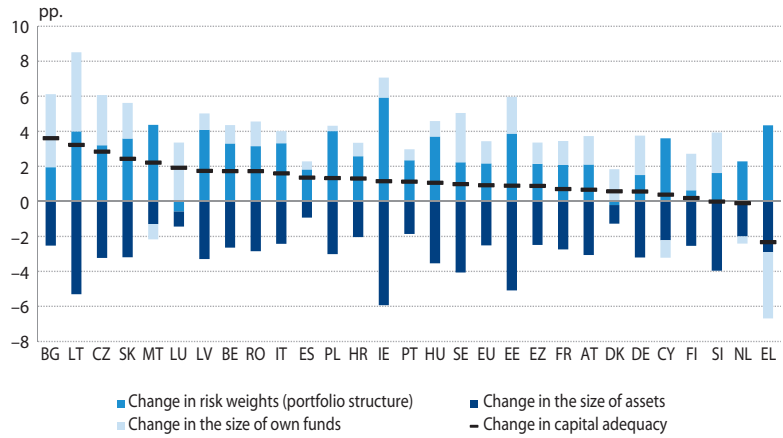


Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

The increase in capital capacity for the expansion of banks may result from both a decrease in capital requirements and an increase in the level of their capital adequacy, i.e. the ratio of own funds to risk-weighted assets. The decrease in the value of assets is relatively rare. It may therefore turn out that the improvement in capital adequacy is not due to an increase in capital endowment of banks, but to a reduction in the scale of operations, a change in the structure of assets or a use of other risk measurement methods. These issues are illustrated in Chart 8, which takes into account the changes in the capital adequacy ratio, taking into account a decomposition into components.

The excess capital of banks is a consequence of changes in their capital adequacy and changes in the capital requirement. Knowing the determinants of change in capital adequacy, the analysis of change in the excess capital may be expanded. This is illustrated in Chart 9.

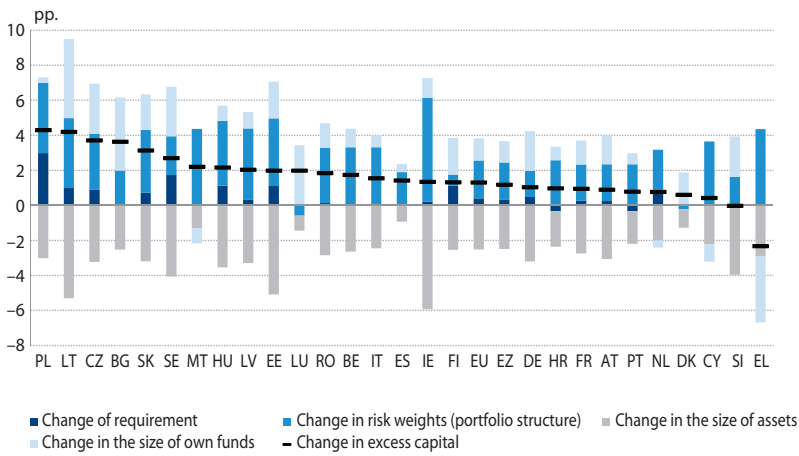
Chart 8. Changes in the capital adequacy of banks in the European Union countries including CAR components between 31 December 2019 and 30 June 2021 (in EUR)*



* An increase in the value of assets leads to a decrease in the excess; an increase in the risk weight of assets leads to a decrease in the excess; an increase in the value of own funds leads to an increase in the excess capital.

Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

Chart 9. Changes in the composition of the excess capital of banks in the European Union countries, expressed in euro between 31 December 2019 and 30 June 2021*

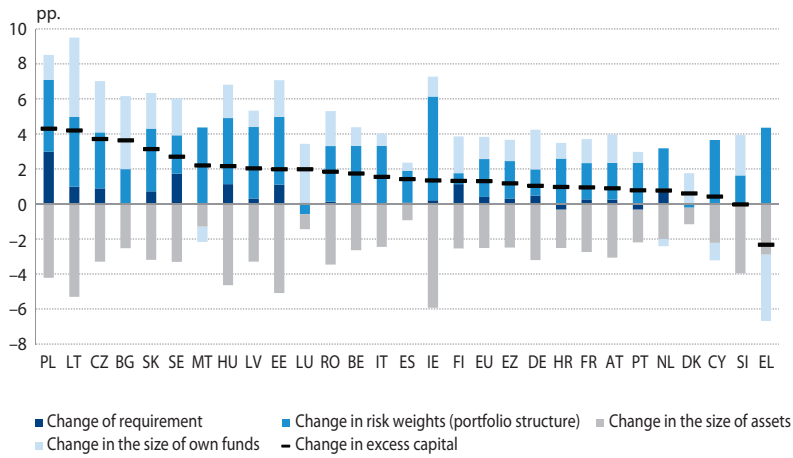


* An increase in the requirement leads to a decrease in the excess; an increase in the value of assets leads to a decrease in the excess; an increase in the risk weight of assets leads to a decrease in the excess; an increase in the value of own funds leads to an increase in the excess capital.

Source: Own study based on data from the ESRB, the ECB and the consolidated accounts of banks.

Charts 8 and 9 illustrate the impact of individual components after the national sectors balance sheet values have been converted into euro. Depending on changes of the exchange rate, the comparison of balance sheet values in euro is encumbered with risk, as illustrated by the example of Poland, where own funds have increased during the pandemic, but the parallel depreciation of zloty has resulted in the value in euro change only slightly. Chart 10 illustrates comparable components in terms of national currencies.

Chart 10. Changes in the composition of the excess capital of banks in the European Union countries, expressed in national currencies between 31 December 2019 and 30 June 2021



Source: Own study based on data from the ESRB, the ECB, stooq.pl and the consolidated accounts of banks.

Chart 10 illustrates that the reconstruction of the capital of banking sectors in the European Union was largely the result of a change in the structure of assets which resulted in the reduction of their average risk weight (from 39.16% to 35.10%). At the same time, the EU banking sector's own funds have increased (by EUR 158.3 billion). This resulted in an increase in the capital adequacy ratio from 18.65% at the end of 2019 to 19.55% at the end of June 2021, despite an asset increase of up to 14.0% (i.e. EUR 4.261 trillion). The effect of the increase in own funds was almost 3.2 times stronger than the effect of the macroprudential fall of the capital requirement by around 0.4 pp (), which released EUR 48.1 billion of own funds (until 30 June 2021). This shows that banks have actively strengthened their capital position during the COVID-19 pandemic. Only in Poland, the Netherlands, Greece, Malta and Cyprus, the impact of loosening the requirements was stronger than the changes in own funds. Malta and Cyprus, as well as the Netherlands and Greece, have seen their decline. This means that from the banking sectors which experienced an increase in own funds, only in Poland its impact on capital capacity

for expansion was lower (twice lower) than the effect of decrease in the capital requirement. This confirms the strength of the supervisory authorities' reaction in Poland, although it points to the weakness of the banks and their poor ability to accumulate capital in crisis (*de facto* retaining profits because the emergence of uncertainty in the financial markets significantly reduces the possibility of issuing debt and equity instruments)[11].

Conclusion

The distinctive feature of the COVID-19 pandemic crisis in the light of previous financial crises was the speed of its spread, as well as the rapid reaction of public and monetary authorities. The priority was to ensure access to financing and to maintain the liquidity of economic operators as well as their solvency. The authorities have taken steps to maintain the capacity of manufacturing enterprises at a time when the anti-pandemic restrictions were sustained. The relevant measures also concerned the banking sector, which would first be affected by a wave of possible bankruptcies of its customers. In order to ensure its smooth operation during and after the pandemic, monetary and supervisory authorities have decided to undertake an unprecedented loosening of monetary and macroprudential policies.

The study showed that more than a year after the outbreak of the pandemic[12], most national macroprudential policies in the European Union countries were less restrictive than before the outbreak. Furthermore, it was pointed out that greater changes in requirements were introduced in countries where, prior to the crisis, supervisory authorities applied a more restrictive macroprudential policy. However, an extreme example of Portugal has shown that even in the face of a reduction in requirements, macroprudential policy may prove more restrictive due to an increase in the share of the banks sector covered by higher requirements.

The article also showed that, in order to reduce the restrictiveness of macroprudential policy in the EU countries, the capital adequacy ratio, including the increase in own funds (e.g. as a result of retained earnings), was 2.3 times more important than loosening the requirements[13]. As a result, despite the increase in assets, additional potential for credit expansion has been achieved. However, this general conclusion does not mean that there were no specific cases. For example, loosening regulations in Poland became the largest in the EU, and the increase in own funds was (relatively) the smallest (Poland was followed only by those countries where own funds shrunk during the period considered).

[11] Structural (tax and regulatory) reasons for the limited ability of Polish banks to increase their own funds are indicated by Kochaniak, Mikołajczyk and Ulrichs in Kochaniak (ed.) (2020).

[12] Exactly 3 months and 14 days of taking actions by the first supervisor in the euro area – the Bank of Finland.

[13] The exception was the Netherlands, Finland, Poland, Sweden, Estonia and Hungary (sequence is not accidental), where loosening requirements, in the face of a decrease in capital adequacy measures, was the main source of growth in excess capital and bank lending capacity.

Finally, the analysis of the change of bank lending capacity, and in particular the arrangement of banking sectors in the European Union according to the scale of its growth, has produced slightly different results than a (simple) analysis of changes in excess capital. The differences were due to the fact that some sectors have a clearly lower average risk weight of assets, either because of their different structure or because of the use of advanced methods of measuring them.

The test carried out is not free from defects or simplifications. Limiting the analysis of the scope of changes to supervisory and regulatory instruments to macroprudential capital requirements has meant that it did not include, for example, the so-called Pillar 2 requirements. In addition, the supervisory activities undertaken in this respect were included only indirectly (in the form of changes in the level of risk weights of assets), without distinguishing between the impact on these weightings of, among many, the introduction of CRR Quick Fix from the sovereign decisions of banks on the change in the holding of securities. Finally, the study does not take into account other supervisory activities, such as encouraging banks to retain their profits generated in 2019. The analysis also does not answer the question whether the increase in the potential to increase the balance sheet (including lending capacity) has translated into a real increase in bank lending.

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Annex

Table Z1. List of banks under analysis

Austria
BAWAG P.S.K. Bank für Arbeit und Wirtschaft und Österreichische Postsparkasse Aktiengesellschaft
Deniz Bank AG
Erste Group Bank AG
HYPO NOE Landesbank für Niederösterreich und Wien AG
Hypo Tirol Bank AG
Hypo Vorarlberg Bank AG
Oberösterreichische Landesbank AG
Raiffeisen Bank International AG
RAIFFEISEN-HOLDING NIEDERÖSTERREICH-WIEN registrierte Genossenschaft mit beschränkter Haftung
Raiffeisenlandesbank Niederösterreich-Wien

Table Z1 – continued

Raiffeisenlandesbank Oberösterreich AG
Sberbank Europe AG
UniCredit Bank Austria AG
Volksbanken Wien AG
Belgium
Argenta Spaarbank NV
AXA Bank Belgium SA
Belfius Banque SA
BNP Paribas Fortis SA
Euroclear Bank
ING Belgium SA
KBC Group NV
The Bank of New York Mellon SA
Bulgaria
Bulgarian Development Bank
Central Cooperative Bank AD
DSK Bank EAD
Eurobank Bulgaria AD
First Investment Bank AD
Raiffeisenbank (Bulgaria) EAD
UniCredit Bulbank AD
United Bulgarian Bank AD
Croatia
Addiko Bank d.d., Zagreb
Erste&Steiermärkische Bank d.d. Rijeka
Hrvatska poštanska banka d.d., Zagreb
OTP banka Hrvatska d.d., Zagreb
Privredna banka Zagreb d.d., Zagreb
Raiffeisenbank Austria d.d., Zagreb
Zagrebačka banka d.d., Zagreb

Table Z1 – continued

Cyprus
Alpha Bank Cyprus Ltd
Astrobank Ltd
Bank of Cyprus Public Company Ltd
Eurobank Cyprus Ltd
Hellenic Bank Public Company Ltd
RCB Bank Ltd
Czech Republic
Česká spořitelna, a.s.
Československá obchodní banka, a.s.
Jakabovič & Tkáč (consolidating liable entity J&T Banka, a.s.)
Komerční banka, a.s.
PPF FH B. V. (consolidating liable entity PPF Banka, a.s.)
Raiffeisenbank, a.s.
UniCredit Bank Czech Republic and Slovakia, a.s.
Denmark
Danske Realkreditselskab A/S
DLR Kredit A/S
Jyske Bank A/S
Nordea Kredit Realkreditaktieselskab A/S
Nykredit Realkredit A/S
Spar Nord Bank A/S
Sydbank A/S
Estonia
AS LHV Pank
AS SEB Pank
Luminor Bank AS
Swedbank AS
Finland
Municipality Finance Plc
Nordea Group
OP Group

Table Z1 – continued

France
BNP Paribas
Groupe BPCE
Groupe Crédit Agricole
Groupe Crédit Mutuel
La Banque Postale
Société Générale
Germany
Bayerische Landesbank
COMMERZBANK AG
DekaBank Deutsche Girozentrale
Deutsche Bank AG
DZ BANK AG
ING-DiBa AG
J.P. Morgan AG
Landesbank Baden-Württemberg
Landesbank Hessen-Thüringen Girozentrale
Landwirtschaftliche Rentenbank
Norddeutsche Landesbank -Girozentrale-
NRW.Bank
UniCredit Bank AG
Volkswagen Bank GmbH
Greece
Alpha Bank S.A.
Eurobank Ergasias S.A.
National Bank of Greece S.A.
Piraeus Bank S.A.
Hungary
CIB Bank Zrt
Erste Bank Hungary Zrt
Kereskedelmi és Hitelbank Zrt.
Magyar Takarékszövetkezeti Bank Zrt

Table Z1 – continued

MKB Bank*
OTP Bank Nyrt.
Raiffeisen Bank Zrt
UniCredit Bank Hungary Zrt
Ireland
Allied Irish Bank Group PLC
Bank of America
Bank of Ireland Group PLC
Barclays Bank Ireland PLC
Citibank Holdings Ireland Ltd
DePfa Bank plc
Ulster Bank Ireland DAC
UniCredit Bank Ireland plc
Italy
Banco BPM
Intesa Sanpaolo S.p.A.
Monte dei Paschi di Siena
UniCredit S.p.A.
Latvia
AS Citadele banka
AS Rietumu Banka
AS SEB banka
Swedbank AS
Lithuania
AB SEB bankas
AB Šiaulių bankas
Swedbank AB
Luxembourg
Banque et Caisse d'Epargne de l'Etat Luxembourg
Banque Internationale à Luxembourg S.A.
BGL BNP Paribas S.A.

Table Z1 – continued

Clearstream Banking S.A.
Deutsche Bank Luxembourg S.A.
J.P. Morgan Bank Luxembourg S.A.
RBC Investor Services Bank S.A.
Société Générale Luxembourg
Malta
APS Bank plc
Bank of Valletta plc
HSBC Bank Malta plc
MDB Group Ltd
the Netherlands
ABN AMRO Bank N.V.
Bank Nederlandse Gemeenten
Coöperatieve Rabobank U.A.
De Volksbank N.V.
ING Bank N.V.
Poland
Alior Bank SA
Bank Handlowy w Warszawie SA
Bank Millennium SA
Bank Polska Kasa Opieki SA
Bank Polskiej Spółdzielczości SA
BNP Paribas Bank Polska SA
Deutsche Bank Polska S.A.
ING Bank Ślaski SA
mBank SA
Powszechna Kasa Oszczedności Bank Polski SA
Santander Bank Polska SA
SGB-Bank SA

Table Z1 – continued

Portugal
Banco BPI
Banco Comercial Português
Caixa Economica Montepio Geral
Caixa Geral de Depósitos
LSF Nani Investments S.à.r.l.
Novo Banco
Santander Totta SGPS
Romania
Alpha Bank Romania S.A.
Banca de Export-Import a României Eximbank S.A.
Banca Comercială Intesa SanPaolo Romania S.A.
Banca Comercială Română S.A.
Banca Cooperatista Creditcoop
Banca Română de Credite şi Investiţii S.A.
Banca Românească S.A.
Banca Transilvania S.A.
BRD – Groupe Societe Generale S.A.
CEC Bank S.A.
Credit Agricole Bank Romania S.A.
Credit Europe Bank S.A.
First Bank S.A.
Garanti Bank S.A.
Idea Bank S.A.
Libra Internet Bank S.A.
OTP Bank Romania S.A.
Patria Bank S.A.
Porsche Bank S.A.
ProCredit Bank S.A.
Raiffeisen Bank S.A.

Table Z1 – continued

Techventures Bank S.A.
UniCredit Bank S.A.
Vista Bank Romania S.A.
Slovakia
Československá obchodná banka, a.s.
Poštová banka, a.s.
Slovenská sporiteľňa, a.s.
Tatra banka, a.s.
Všeobecná úverová banka, a.s.
Slovenia
Abanka d.d.
Intesa Sanpaolo
Nova Kreditna Banka Maribor d.d.
Nova Ljubljanska Banka d.d.
SID – Slovenska izvozna in razvojna banka d.d.
SKB Banka d.d.
UniCredit Banka Slovenija d.d.
Spain
Banco Bilbao Vizcaya Argentaria, S.A.
Banco de Sabadell, S.A.
Banco Santander, S.A.
BFA Tenedora de Acciones S.A.U. (holding of Bankia, S.A.)
CaixaBank, S.A.
Sweden
Nordea Hypotek AB
Skandinaviska Enskilda Banken AB (SEB)
Svenska Handelsbanken AB
Swedbank AB

Source: Own study.

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Impact of the COVID-19 pandemic on the operations of commercial banks in Poland

Abstract

The impact of the COVID-19 pandemic on profitability, financial results and stability of commercial banks was analyzed. An extensive review of domestic and foreign publications on this subject was carried out; and with regard to commercial banks in Poland, monthly reporting data (from March 2020 to July 2021) was analysed using the least squares method (*ordinary least squares*, OLS). The OLS method choice was dictated by the nature of data and the results of statistical tests. The results showed that the profitability analyzed with ROA and ROE indicators was, in the analyzed period, negatively related to the number of cases, while the net interest income was negatively related to both the number of cases and deaths due to COVID-19. There was also no negative impact of the pandemic on the commission income and operating result noted. No negative impact of the COVID-19 epidemic was recorded in terms of the stability measured with the NPL, Z-score and MPLS indicators.

Key words: bank, profitability, stability, pandemic, COVID-19

JEL codes: G21, I15, O16

Wpływ pandemii COVID-19 na działalność banków komercyjnych w Polsce

Streszczenie

Analizie poddano wpływ pandemii COVID-19 na rentowność, wyniki finansowe i stabilność banków komercyjnych. Przeprowadzono szeroki przegląd publikacji krajowych i zagranicznych na ten temat a w odniesieniu do banków komercyjnych w Polsce zanalizowano miesięczne dane sprawozdawcze od marca 2020 r. do lipca 2021 r.) z wykorzystaniem metody najmniejszych kwadratów (ang. OLS). Wybór metody OLS podyktowany był charakterem danych oraz wynikami testów statystycznych. Wyniki wskazały, że rentowność analizowana wskaźnikami ROA i ROE pozostawała w badanym okresie w negatywnej zależności wzglę-

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dem liczby zachorowań, podczas gdy wynik z tytułu odsetek był w negatywnej zależności zarówno względem liczby zachorowań oraz zgonów z powodu COVID-19. Nie odnotowano także negatywnego wpływu pandemii na wynik z tytułu prowizji oraz wynik z działalności operacyjnej. W zakresie stabilności badanej wskaźnikami NPL, Z-score i MPLS nie odnotowano negatywnego wpływu epidemii COVID-19.

Słowa kluczowe: bank, rentowność, stabilność, pandemia, COVID-19

Introduction

About 11 years after the global financial crisis (GFC) from the end of the first decade of the 21st century, another black swan has landed in the economy, this time in the form of the SARS-CoV-2 virus, also known as COVID-19 (Yang et al. 2020, p. 1). The rapid spread of COVID-19 has transformed the health crisis into a social, financial and economic one. The World Bank (2021) estimates that in 2020, global gross domestic product decreased by approximately 4.3%, which was the largest decrease since the end of World War II. It was assumed in the intervention activities that the banking sector was to constitute a protective buffer for households and non-financial enterprises, ensuring adequate financing. Moreover, in addition to the expansionary fiscal policy, it has been assumed that the banking sector will remain stable and will actively support the recovery of economies from the pandemic crisis.

Preliminary analyzes indicate that banks experienced this endogenous shock relatively gently, amongst others, as a result of actions taken by central banks to support banks' liquidity and, in a way, thanks to strengthening of the capital position of the banking sector after the global financial crisis. As Kulińska-Sadłocha, Marcinkowska and Szambelańczyk (2020, pp. 54–55) indicate, the high level of advancement of electronic banking and mobile is also worth taking into account, which, compared to other sectors, was undoubtedly a factor facilitating the use of banking services during the lockdown and restrictions in an uninterrupted manner.

The purpose of this study is to assess the impact of the COVID-19 pandemic on the Polish commercial banks in the period from March 2020, i.e. the first case of the virus detection in Poland, to July 2021. The research was based on the reporting data of commercial banks due to the fact that their assets constituted about 90% of the assets of the entire banking sector. The main purpose of the study was accompanied by the following hypotheses:

- H1: the COVID-19 pandemic negatively affected the profitability and financial results of commercial banks in Poland;
- H2: the COVID-19 pandemic negatively affected the stability of commercial banks in Poland.

In the first part of the study, the literature on the discussed issues was reviewed, then collected data was calculated using the least squares method and the results of the calculations were presented. The final part presents conclusions and

recommendations for further research. The study uses data published by the Polish Financial Supervision Authority (KNF), the Central Statistical Office (GUS), the World Health Organization (WHO) and the National Bank of Poland (NBP).

1. Review of the subject literature on the impact of the COVID-19 pandemic

The analysis of the consequences of the COVID-19 pandemic for the Polish banking sector was carried out, among others, by Kulińska-Sadłocha et al. (2020, pp. 54–55), characterizing the interventions taken to maintain the continuity of banking functions. Moreover, the financial situation of banks in Poland was compared in two periods, i.e. before the start of the COVID-19 pandemic and after taking relief measures. As the authors point out, as a result of the actions taken, banks reported, inter alia, an increase in other operating expenses, LCR and NPL liquidity ratios with a decrease in ROA, ROE and assets in the debt instruments category. There was also lending policy criteria tightening, in particular in relation to new customers and customers who were exposed to financial problems due to the consequences of the pandemic. The postulates suggested to use fiscal stimulus to limit the restrictiveness of banks' lending policy.

Hryckiewicz and Olszak (2021, p. 180) stated that the COVID-19 pandemic had an adverse effect on bank lending. The largest decreases in financing concerned enterprises and households. Sales of operating loans to large and small and medium-sized enterprises (SMEs) were found to have decreased since the pandemic began by around 13.5% and 13.1%, respectively. In the group of households, the sale of consumer loans decreased the most – by approximately 3.3%. The authors estimated that the decline in lending during the first months of the COVID-19 pandemic was greater than in the case of GFC.

Solarz and Waliszewski (2020, pp. 95–98) analyzed the effects of the COVID-19 pandemic through the prism of systemic risk, by claiming that the resulting economic recession and growing social problems generate systemic risk, among others, due to the spread mechanism, the scope and scale of the impact, and the difficulties in containing threats. They suggested that overcoming the COVID-19 pandemic requires coordinated actions – not only in epidemiological terms, but also in financial, economic and social spheres. They also emphasized that local governments play a very important role in managing systemic risk during the COVID-19 epidemic.

From a perspective that goes beyond Poland, research on the stability of banks during the COVID-19 pandemic was carried out, among others, by Elnahass, Trinh, and Li (2021, pp. 1–3, 21–22). In their research sample, they used quarterly data for 2019–2020 from 1090 banks operating in 116 countries. The obtained results indicated that the COVID-19 pandemic had a negative impact, among others, on the ROA ratio, ROE, market price to book value (P/BV), as well as on the Z-score

and NPL. The authors also decomposed data aggregated according to the continent criterion, the level of economic development (developed and developing countries), the size of the bank (small and large) or religion (conventional and Islamic banks) and they found similar regularities in the selected subgroups.

The article by Korzeba, Niedziółka, and Silva (2021, pp. 227–228, 240) assessed the impact of the COVID-19 pandemic on the financial situation of 19 Portuguese banks. The obtained results indicated that individual banks reacted to the pandemic shock to an unequal degree. According to the value of assets, none of the four largest Portuguese banks belonged to the group of institutions most resistant to the pandemic crisis, which may indicate an increase in systemic risk while prolonged pandemic.

Baret, Celner, O'Reilly and Shilling (2020, p. 6) stated that the increase in the value of risk-weighted assets may result from large fluctuations in the economy and an increase in counterparty risk. In their opinion, a further GDP decline will lead to a decline in loan sales, what combined with low interest rates, will most likely reduce banks' interest margins, and all this, despite liquidity-enhancing interventions, may increase the number of banks failing the stress tests.

Acharya, Engle, and Steffen (2021, pp. 1, 40–41) examined the relationship between the value of credit lines and the value of US banks' shares during the COVID-19 pandemic. The results showed that the decline in share prices occurred primarily in those banks that had open credit lines. Moreover, despite the assistance measures taken, these banks significantly reduced their lending. Similar research in the field of, inter alia, credit lines was conducted by Acharya and Steffen (2020). In the case of full use of credit lines by enterprises, it was found that the ratio of Tier 1 capital to risk-weighted assets may drop to the level of around 10–11%, and in the case of some banks even below 8%.

Rizwan, Ahmad and Ashraf (2020, pp. 1–2, 6–7) analyzed the banking sectors of China, France, Spain, Germany, Canada, Italy, the United States and the United Kingdom in terms of systemic risk. From December 2019 to April 2020, the systemic risk in the banking sector in the analyzed sectors was at a higher level than during the 2007–2009 GKC, although the intervention measures undertaken at the end of Q1 2020 limited the increase in this risk.

The monograph by Carletti, Claessens, Fatas and Vives (2020, p. 19) showed that the COVID-19 pandemic accelerated the trends in the advancement of digitization of banking services, thus increasing their competitiveness. At the same time, small and medium-sized banks that have problems with financing costly technological investments found themselves in a particularly difficult situation.

Aldasoro, Fender, Hardy, and Tarashev (2020, pp. 1, 6), found – based on bank stock prices, credit default swap (CDS) spreads, and financing costs – that the covid breakdown was tantamount to the one of the Lehman Brothers investment bank in the second half of 2008. They noted that with the start of the COVID-19 pandemic, bank stock prices fell more than those of companies in other sectors. On the other

hand, the CDS market was strongly dependent on the ROA level of the pre-pandemic banks and the method of their financing. Low CDS spreads existed for banks that achieved higher profitability before the pandemic and for banks that relied on long-term funding. Moreover, it was found that banks with "healthy" balance sheets benefited the most from various types of assistance measures.

Ari, Chen, and Ratnovski (2020, pp. 1, 6–7) warn that effective and efficient management of low-quality loans (NPLs) can be a significant challenge in the event of a prolonged pandemic and economic downturn.

On the other hand, Dooseman, Marchat, and Guillard (2020) argue that the COVID-19 pandemic may make it necessary to adjust the models of credit risk assessment and its parameters (e.g. probability of default or loss given default) to new economic conditions. In terms of operational risk, the authors noted that the COVID-19 pandemic, which accelerated digital transformation, increased also cyber risk. Moreover, Dooseman et al. (2020) indicated that providing banks with adequate liquidity will be a key element of their continued and stable operation in the current pandemic crisis.

In the study by Hardy and Takats (2020, pp. 89–90, 98), on the basis of aggregate data, it was found that at the initial stage of the pandemic banks were the first line of defense, as there was no significant decrease in funding, among others, for entities from the non-financial sector. Though, they did not reject the scenario in which successive waves of COVID-19 may lead to lockdowns and in consequence to a slowdown in economic processes, especially in the case of limiting lending.

Apart from the characterized research, many publications concern the situation on the stock exchange. For instance, Bernardelli, Korzeb, Niedziółka (2021, pp. 335–336) analyzed investors' decisions based on the listings of 12 Polish banks on the Warsaw Stock Exchange in the period from January to June 2020. In the initial phase of the pandemic crisis, stocks of banks with low regulatory capital characterized by an average level of liquidity, as well as, medium-sized banks in terms of the value of assets, in whose loan portfolios corporate loans dominated, were perceived the worst by investors. The situation normalized only after the government took anti-covid measures. Similar conclusions were reached by Demirguc-Kunta, Pedraza and Ruiz-Ortega (2020, pp. 27–29), who analyzed the prices of banks' shares in 53 countries, and concluded that the outbreak of the COVID-19 pandemic had a particularly negative impact on banks compared to non-financial entities, although the shock was limited thanks to the provision of liquidity to banks and the undertaking of an expansionary monetary policy by central banks.

Moreover, Al-Awadhi, Alsaifi, Al-Awadhi and Alhammadi (2020, pp. 1–2, 4) analyzed the impact of COVID-19 on the stock market in China. Based on an analysis of the stocks included in the Hang Seng and Shanghai Stock Exchange Composite Indexes, they concluded that COVID-19 had a negative impact on rates of return. They also noted that the rates of return negatively correlate, in particular, with the daily number of confirmed infections and deaths caused by COVID-19. Similar studies

and results on the impact of COVID-19 on stock exchanges were carried out, among others, by Ashraf (2020, pp. 1–2, 5–6). The results that he obtained also showed a negative relationship between the rate of return and the number of confirmed COVID-19 cases. Chen, Chen, Tang, and Huang (2007), Chen, Jang, and Kim (2008) also conducted research on the impact of COVID-19 on stock exchanges. Ichev and Marinč (2018, p.1) carried out research in cases of other pandemic diseases, they observed a decline in share prices of companies operating in the Ebola virus area.

According to the Report on the stability of the financial system of the National Bank of Poland (2020, pp. 6–7), the COVID-19 pandemic did not significantly affect the stability of the financial system in Poland, however the risk of worsening of the situation still exists. According to this report, there was no decrease in loan sales, although the covid shock worsens the financial situation, especially of banks with low capital. Moreover, according to the study by the Polish Bank Association (2020, pp. 17–20), electronic and mobile banking functioned correctly, supporting clients during lockdowns and limiting the adverse consequences of the pandemic.

2. Methodology, data and research results

This section describes the author's own empirical study of the impact of the COVID-19 pandemic on profitability ratios, financial results and measures of the stability of commercial banks in Poland. The analysis covers the period from March 2020 to July 2021 and includes monthly reporting data. The beginning of the research, dated to March, results from the first cases of COVID-19 cases and deaths in Poland. The reporting data are taken from the publications of the Polish Financial Supervision Authority, GUS, WHO and NBP. The results of the statistical tests are included in the appendix.

2.1. Impact of the COVID-19 pandemic on the profitability, financial performance and stability of commercial banks

Due to the research period of less than one and a half years, the available monthly reporting data was used, which made it possible to obtain a time series including 17 observations. The adopted solution limited the possibility of using variables such as, for instance, gross domestic product or GDP per capita. The reporting data was not panel-based, so it was decided to use the classic least squares method to verify the hypotheses formulated in the scientific description. For dependent variables in the scope of:

- profitability and financial results (PROF.M) were assumed: return on assets y/y (ROA, see Gospodarowicz, Nosowski, 2012, p. 223), return on equity y/y (ROE, see Gospodarowicz, Nosowski, 2012, p. 224), net interest income y/y, net commission income y/y and operating result y/y,

- bank stability (STAB.M), were assumed: the level of non-performing loans (NPL, see Gospodarowicz, Nosowski, 2012, p. 229), the Z-score stability index (see Miklaszewska, Kil, Idzik, 2021, p. 10) and the comprehensive bank health indicator (*multi-level performance score*, MLPS, see Miklaszewska, Kil, Idzik, 2021, 2021, pp. 10–11).

Based on the literature on the subject and the availability of monthly data, 24 independent variables were selected at the preliminary selection stage, including 2 COVID-19 variables, 9 macroeconomic variables and 13 variables characterizing the activity of commercial banks. Based on the analysis of the values of the correlation matrix and the collinearity test (*variance inflation factor*, VIF), the analysis finally used 2 covid variables, 2 macroeconomic variables and 4 variables related to the functioning of banks. Due to the adopted delays of the independent variables (shifts by one month) the number of monthly observations in the model estimates is 16 months. The description and characteristics of the dependent and independent variables are presented in Table 1.

Table 1. Characteristics of the dependent and independent variables used in the study

Variable	Description	Data source	Concepts or research relating to a variable
Dependent variables – PROF.M			
ROA	Return on assets	PFSA	Elnahass, Trinh, Li (2021); Ari, Chen, Ratnovski (2021); Dursun – de Neef, Schandlbauer (2021); Miklaszewska, Kil, Idzik (2021)
ROE	Return on equity		Elnahass, Trinh, Li (2021); Ari, Chen, Ratnovski (2021); Dursun –de Neef , Schandlbauer (2021), Korzeb, Niedziółka (2021); Miklaszewska, Kil, Idzik (2021)
NII	Net interest income		–
NCI	Net commission income		–
OP	Operating profit		–
Dependent variables – STAB.M			
NPL	Non–performing loans to total loans	PFSA	Elnahass, Trinh, Li (2021); Dursun – de Neef, Schandlbauer (2021); Korzeb, Niedziółka (2021); Miklaszewska, Kil, Idzik (2021)

Table 1 – continuation

Variable	Description	Data source	Concepts or research relating to a variable
Z– score	Stability ratio based on the financial performance and leverage of the bank		Elnahass, Trinh, Li (2021); Karkowska, Korolczuk (2017); Miklaszewska, Kil, Idzik (2021)
MPLS	Comprehensive bank health indicator		Miklaszewska, Kil, Idzik (2021)
Independent variables – LN_COVID19			
LN_COVID_NC_t–1	Natural logarithm of the sum of the monthly number of new COVID-19 cases	*https://covid19.who.int/region/euro/country/pl (accessed on 02/10/2021)*	–
LN_COVID_ND_t–1	The natural logarithm of the sum of the monthly number of new COVID-19 deaths		–
Independent variables – ZM_MACROECON			
BC_R_t–1	NBP reference rate	NBP	–
BC_TA_t–1	Dynamics of changes in the balance sheet total of NBP		–
Independent variables – ZM_BANK			
LOANS_chg_t–1	Dynamics of changes in credits and loans	PFSA	Korzeb, Niedziółka (2021)
CI_t–1	Costs to revenues ratio		Elnahass, Trinh, Li (2021); Miklaszewska, Kil, Idzik (2021); Bernardelli, Korzeb, Niedziółka (2021)
EQ_TA_t–1	Equity to the balance sheet total of commercial banks		Dursun – de Neef, Schandlbauer (2021); Miklaszewska, Kil, Idzik (2021)
II_chg_t–1	Dynamics of interest income		Ari, Chen, Ratnovski (2021)

Source: own study.

The functional forms of the analyzed models were described by the formula (1) and (2).

$$PROF.M_{it} = \alpha + \beta_1 LN\_COVID19_{i,t-1} + \beta_2 ZM\_MAKROEKON_{i,t-1} + \beta_3 ZM\_BANK_{i,t-1} + \varepsilon_{it} \quad (1)$$

$$STAB.M_{it} = \alpha + \beta_1 LN\_COVID19_{i,t-1} + \beta_2 ZM\_MAKROEKON_{i,t-1} + \beta_3 ZM\_BANK_{i,t-1} + \varepsilon_{it} \quad (2)$$

Where:

PROF.M – measure of profitability and financial results expressed by the ROA, ROE ratios, net interest income, net commission income and operating result;
STAB.M – stability measure expressed by the NPL, Z-score or MLPS index;
LN_COVID19 – the natural logarithm of the sum of monthly COVID-19 cases or the natural logarithm of the sum of recorded deaths due to COVID-19;
ZM_MACROECON – vector of macroeconomic variables described in Table 1;
ZM_BANK – vector of variables describing the activities of commercial banks described in Table 1.

In the analyzed period, the explanatory variable ROA and ROE was adversely affected by the number of monthly COVID-19 cases (models 1, 3), the dynamics of changes in loans and borrowings (models 1,2, 4) and the ratio of equity to total assets (models 1–4). A positive relationship for ROA and ROE was noted for the NBP reference rate (models 2, 4) and the dynamics of interest income (models 1–4). In the case of the C/I ratio parameter, its interpretation is in contradiction to the theoretical assumptions, which could have been influenced by a relatively short series of observations, in which there was a simultaneous decline in ROA, ROE and C/I.

The number of monthly cases and deaths due to COVID-19 had a negative impact on the result on the interest of commercial banks (models 5–6). This can be interpreted by the increase in non-performing loans in the first months of the pandemic. It could also result, inter alia, from the reduction of the reference rate by the NBP, because, as shown by the model, the net interest income and the net commission income remained in a positive relation to it in the analyzed period (models 5–8). For the net interest income and net commission income, there was also noted a negative correlation with the C/I ratio and with the dynamics of interest income (models 5–8). The equity-to-assets ratio was positively correlated with the net interest income (models 5–6) and correlated negatively with the net commission income (models 7–8).

In the case of the operating result, the model proved a negative relationship for the ratio of equity to total assets (models 9–10) and a positive relationship for the dynamics of interest income (models 9–10).

The analysis of profitability ratios and financial results made it impossible to unambiguously verify the H1 hypothesis. Therefore, the overall assessment of the

H1 hypothesis was replaced with its individual components. Thus, it was found that the H1 hypothesis was:

- positively verified for ROA, ROE indicators and net interest income in terms of the number of new COVID 19 cases (models 1, 3, 5),
- positively verified for the net interest result in relation to the number of new deaths from COVID-19 (model 6),
- negatively verified for ROA and ROE indicators in terms of the number of new deaths from COVID-19 (models 2, 4) and the result on interest and operating result for both covid variables (models 7–10).

In relation to the variables characterizing the stability of commercial banks, no negative impact of the COVID-19 pandemic on NPL, Z-score and MLPS (models 11–16) was recorded in the analyzed period. This gave rise to a negative verification of the H2 hypothesis. The significant variables independent of the NPL were the dynamics of the change in the balance sheet total of the NBP, the increase of which led to a decrease in non-performing loans (models 11–12). A negative correlation was also noted for the NBP reference rate (models 11–12). This could be related to the fact that despite the MPC (The Monetary Policy Council) lowering the interest rates, the level of non-performing loans was rising at the beginning of the analyzed period. There was a positive relationship with NPL for the C/I ratio and the ratio of equity to balance sheet total (models 11–12).

It was observed that the increase in the NBP reference rate was positively related to the MLPS index. On the other hand, the ratio of equity to total assets was negatively related to MLPS.

Table 2. Estimation results of eight models for the dependent variable ROA, ROE, net interest income and net commission income for a series of 16 observations from April 2020 to July 2021

Independent variables	Dependent variable / model designation							
	ROA / 1	ROA / 2	ROE / 3	ROE / 4	NII / 5	NII / 6	NCI / 7	NCI / 8
const	0.061*** (0.01)	0.073*** (0.011)	0.59*** (0.093)	0.7*** (0.102)	-0.775*** (0.112)	-0.634*** (0.17)	1.32*** (0.056)	1.188*** (0.065
LN_COVID_ NC_t-1	-4.89E-04* (2.47E-04)		-0.005* (0.002)		-0.008*** (0.002)		0.006*** (0.001)	
LN_COVID_ ND_t-1		-5.74E-04 (3.19E-04)		-0.006 (0.003)		-0.007** (0.003)		0.007*** (0.001)
BC_R_t-1	0.28 (0.182)	0.37** (0.15)	2.412 (1,731)	3,292* (1,433)	5.689** (1,968)	7.477*** (1,952)	8.519*** (1,238)	7.467*** (1,155)
BC_TA_t-1	0.01 (0.01)	0.011 (0.01)	0.093 (0.097)	0.104 (0.1)	-0.056 (0.077)	-0.034 (0.082)	0.052 (0.069)	0.039 (0.07)
LOANS_chg_t-1	-0.046* (0.021)	-0.071*** (0.014)	-0.361 (0.205)	-0.598*** (0.132)	0.287 (0.46)	-0.059 (0.471)	-0.661 * (0.323)	-0.376 (0.319)
CI_t-1	0.027** (0.009)	0.026** (0.008)	0.234** (0.084)	0.221** (0.075)	-0.647*** (0.047)	-0.692*** (0.055)	-0.175*** (0.034)	-0.158*** (0.034)
EQ_TA_t-1	-0.732*** (0.081)	-0.853*** (0.104)	-6.874*** (0.754)	-8.041*** (0.97)	11.335*** (1,149)	9.817*** (1,501)	-11.977*** (0.611)	-10.579*** (0.643)
II_chg_t-1	0.002* (0.001)	0.002* (0.001)	0.016* (0.008)	0.013* (0.007)	-0.028*** (0.005)	-0.034*** (0.005)	-0.016*** (0.004)	-0.013*** (0.003)
Specification	**Model parameters**							
Skor. R-square	0.735	0.727	0.727	0.716	0.955	0.94	0.926	0.92
F-test	0	0	0	0	0	0	0	0
VIF (max.)	5.243	4.507	5.243	4.507	5.243	4.507	5.243	4.507

Note: The values in parentheses are heterocadastic standard errors.

Source: own elaboration. Number of observations in models 1–8: 16.

Table 3. The results of model estimation for the dependent variable operating profit, NPL, Z-score and MLPS – models 9-16 depending on the adopted set of explanatory variables

Independent variable	Dependent variable / model designation							
	OP/9	OP/10	NPL/11	NPL/12	Z-score/13	Z-score/14	MLPS/15	MLPS/16
const	10.72*** (1,473)	11.735*** (1,473)	-0.005 (0.005)	-0.005 (0.008)	-109.861 (632,965)	-344.512 (653,019)	206.915*** (16.51)	220.855*** (21,834)
LN_COVID_ NC_t-1	-0.053 (0.031)		1.32E-04 (7.42E-05)		15.872 (9,238)		-0.802 (0.44)	
LN_COVID_ ND_t-1		-0.053 (0.04)		2.61E-05 (1.34E-04)		12.795 (9,046)		-0.736 (0.651)
BC_R_t-1	-5.798 (24,766)	5.848 (21,403)	-0.527*** (0.078)	-0.579*** (0.078)	9005 (10,724.6)	4,822.54 (9,338.92)	1458.85*** (355,706)	1650.8*** (304,455)
BC_TA_t-1	1.068 (0.879)	1.215 (0.942)	-0.007* (0.003)	-0.007* (0.003)	422.574 (518,637)	371.315 (502.47)	16.383 (15,939)	18.775 (17,196)
LOANS_chg_t-1	1.464 (4,186)	-0.943 (3,361)	0.003 (0.018)	0.006 (0.016)	-4246.53 (2,732.92)	-3594.61 (2,583.38)	-83.576 (54.764)	-118.686** (44,878)
CI_t-1	4.688*** (0.97)	4.414*** (0.905)	0.011*** (0.002)	0.013*** (0.003)	2300.82*** (328,702)	2426.68*** (327,384)	28.968 (16,656)	23.862 (15,136)
EQ_TA_t-1	-128.301*** (12,182)	-139.165*** (12,911)	0.603*** (0.046)	0.606*** (0.064)	-11,437.2 (6229.92)	-8862.98 (6,022.12)	-2249.41*** (132,049)	-2399.96*** (203,542)
II_chg_t-1	0.554*** (0.092)	0.518*** (0.076)	3.68E-04* (1.96E-04)	0.001** (2.14E-04)	-58.236* (25,465)	-45.498* (23,891)	1.712 (1,806)	1.124 (1,538)
Skor. R-square	0.888	0.877	0.829	0.812	0.674	0.65	0.826	0.808
F-test	0	0	0	0	0	0	0	0
VIF (max.)	5.243	4.507	5.243	4.507	5.243	4.507	5.243	4.507

Source: own study. Heterocadastically compatible standard errors are given in brackets. The number of observations in the 9–16 models: 16.

Summary

The aim of the study was to assess the short-term impact of the COVID-19 pandemic on the operations of commercial banks in Poland.

An unambiguous verification of the H1 hypothesis was impossible, therefore an attempt to decompose it and evaluate its individual components was made. On the basis of the above assumption, it was found that the negative impact of the COVID-19 pandemic, expressed in the number of new cases of SARS-CoV-2 virus, was recorded in relation to the ROA and ROE indicators and to the result on interest. The analysis indicated also that the net interest income was also negatively affected by the number of new deaths due to COVID-19. On the other hand, the quantitative study negatively verified the H1 hypothesis in terms of the relationship between ROA and ROE and the number of new deaths due to COVID-19. In the case of commission and operating result, verification of the H1 hypothesis was also negative for both covid variables.

With regard to the measures of stability of commercial banks, i.e. NPL, Z-score and MLPS, the H2 hypothesis was negatively verified, which can be interpreted as meaning that the COVID-19 pandemic did not contribute to a significant deterioration of the stability of Polish commercial banks in the analyzed period.

The results of the analyzes are similar to the results of other studies. For instance, Elnahass, Trinh and Li (2021) obtained the same results for ROA and ROE indicators, but different for NPL and Z-score. It should be noted that in this study only commercial banks in Poland were studied, while in the analysis by Elnahass, Trinha and Li (2021), the base was 1090 banks from 116 countries. Whereas, compared to the analyzes by Baret, Celner, O'Reillie and Shilling (2020), the same results were obtained for central bank interest rates (their reduction after the COVID-19 pandemic resulted in a decrease in banks' net interest income). Acharya, Engle, and Steffen (2021) found that the COVID-19 pandemic limited bank lending. Similar conclusions were formulated by Hryckiewicz and Olszak (2021). Only in the first months of the pandemic, the Polish sector of commercial banks saw a decline in the growth rate of loans and advances, as after about 6 months this ratio began to increase again, especially in relation to the sale of housing loans, which should be associated with the reduction of interest rates by the NBP. What is more, Ari, Chen and Ratnovski (2020) found that the prolonged COVID-19 pandemic significantly increases the risk of an increase in NPL. On the other hand, in the Polish market, in the initial months of the pandemic, an increase in NPLs in the portfolios of commercial banks was observed, but after a few months their level returned to the level from before the pandemic.

Despite the fact that as a result of the COVID-19 pandemic, the profitability and financial results of commercial banks in Poland decreased, mainly in the first months of the COVID-19 epidemic compared to previous years, this did not adversely affect their stability. In the context of interventions and the situation of banks at

the end of 2021, the COVID-19 pandemic appears to have had a rather short-term and temporary impact on the performance of commercial banks. Whereas there are no extraordinary circumstances requiring actions similar to those from the lockdown from 2020, the stability of commercial banks in Poland is not threatened. However, the portfolio of housing loans based on variable interest rates is a factor that constitutes a significant risk factor not only for commercial banks, but also for the entire banking sector. The more that it is highly probable that the MPC will significantly raise interest rates.

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Statistical tables

Table A. Correlation matrix for studying the impact of the COVID-19 pandemic on profitability, financial results and stability of commercial banks

	ROA	ROE	W_OD	W_PR	W_DZ_OP	NPL	Z-score	MLPS	LN_COVID_NC	LN_COVID_ND	BC_R	BC_TA	LOANS_chg	C/I	EQ_TA	II_chg
ROA	1.00															
ROE	1.00	1.00														
NII	-0.49	-0.49	1.00													
NCI	0.68	0.69	-0.76	1.00												
OP	0.85	0.87	-0.77	0.80	1.00											
NPL	-0.76	-0.77	0.19	-0.69	-0.68	1.00										
Z-score	0.44	0.41	-0.49	0.39	0.26	-0.03	1.00									
MLPS	0.95	0.95	-0.42	0.75	0.84	-0.91	0.31	1.00								
LN_COVID_NC	-0.21	-0.21	-0.58	0.16	0.13	0.40	0.29	-0.28	1.00							
LN_COVID_ND	-0.04	-0.03	-0.71	0.39	0.31	0.18	0.32	-0.06	0.93	1.00						
BC_R	0.08	0.06	0.64	-0.17	-0.27	-0.33	0.01	0.18	-0.50	-0.59	1.00					
BC_TA	-0.12	-0.13	0.33	-0.17	-0.26	-0.06	0.02	-0.04	-0.28	-0.24	0.35	1.00				
LOANS_chg	0.50	0.51	-0.17	0.45	0.41	-0.52	0.17	0.51	-0.19	-0.26	0.38	-0.08	1.00			
C / I	0.13	0.09	-0.13	0.24	-0.10	0.04	0.75	0.07	0.18	0.17	0.29	0.18	0.11	1.00		
EQ_TA	-0.49	-0.51	0.90	-0.84	-0.81	0.41	-0.20	-0.52	-0.32	-0.54	0.61	0.27	-0.19	0.09	1.00	
II_chg	0.16	0.16	0.05	-0.12	0.21	-0.21	-0.06	0.22	-0.10	-0.14	0.25	0.11	0.13	-0.43	0.03	1.00

Source: own study.

Table B. Statistics for variables in the study of the impact of the COVID-19 pandemic on profitability, financial results and stability of commercial banks

	mean	Standard deviation	Min.	Max.
ROA	-0.002	0.003	-0.008	0.001
ROE	-0.013	0.023	-0.071	0.017
NII	-0.054	0.074	-0.154	0.069
NCI	0.118	0.036	0.073	0.175
OP	-0.081	0.504	-0.812	0.687
NPL	0.061	0.002	0.057	0.063
Z-score	141.372	134.809	29.030	494,584
MLPS	-6.176	6.766	-18,000	5,000
LN_COVID_NC	10.740	1.927	7.745	13.350
LN_COVID_ND	7.300	1.829	3.497	9.579
BC_R	0.002	0.003	0.001	0.013
BC_TA	0.025	0.037	-0.047	0.102
LOANS_chg	0.001	0.011	-0.017	0.024
C / I	0.517	0.042	0.482	0.649
EQ_TA	0.099	0.004	0.093	0.105
II_chg	0.200	0.357	-0.920	0.911

Source: own study

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The new monetary policy strategy of the European Central Bank – continuity and change

Abstract

The ECB's original monetary policy strategy was adopted in 1998 and updated in 2003. Since then, there have been several important developments and shocks experienced by the European economy (financial and economic crises, periods of very low inflation and unconventional monetary policy, COVID-19 pandemic, etc.). Moreover, in the meantime, climate change has become an issue of growing importance in the EU. All those issues have prompted and influenced a review of the ECB's strategy. The new strategy was published in July 2021.

This article focuses on several new elements of the ECB's strategy. The first one is the issue of the costs of living in private homes (owner-occupied housing – OOH) and their planned integration into the coverage of the ECB's inflation index (HICP). This is aimed at improving cross-country comparability as well as the representativeness of the HICP, as OOH costs represent an important share of household consumption. The second element is climate change and its economic consequences, which are to be taken into account when making monetary policy decisions by the Governing Council. Different views, pros and cons, advantages and disadvantages, etc., have been presented with regard to the above issues. The last part of the article provides some concluding remarks and recommendations.

Key words: central bank, strategy, monetary policy, inflation, owner-occupied housing / housing costs, climate change, stress test

JEL codes: E52, E58, Q54

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Nowa strategia polityki pieniężnej Europejskiego Banku Centralnego – kontynuacja i zmiana

Streszczenie

Pierwotna strategia polityki pieniężnej EBC została przyjęta w 1998 r., a następnie zaktualizowana w 2003 r. Od tamtego czasu nastąpiło wiele istotnych zdarzeń, których doświadczył europejski system ekonomiczno-społeczny (kryzysy finansowe i gospodarcze, okresy bardzo niskiej inflacji i niekonwencjonalnej polityki pieniężnej, pandemia COVID-19 itp.). Ponadto, sprawą o rosnącym znaczeniu w UE stały się zmiany klimatyczne. Wszystko to skłoniło do przeglądu i weryfikacji strategii EBC. Nowa strategia została opublikowana w lipcu 2021 r.

Artykuł koncentruje się na nowych elementach strategii EBC. Pierwszym z nich jest kwestia kosztów mieszkaniowych (ang. *owner-occupied housing*) i ich planowanego włączenia do zakresu wskaźnika inflacji stosowanego przez EBC (HICP). Ma to poprawić transgraniczną porównywalność wskaźnika HICP, a także jego reprezentatywność, gdyż koszty mieszkaniowe stanowią istotną część konsumpcji gospodarstw domowych. Drugim elementem są zmiany klimatyczne i ich konsekwencje gospodarcze, które należy brać pod uwagę w polityce pieniężnej EBC. W artykule przedstawiono różne poglądy, argumenty za i przeciw, zalety i wady itp. Ostatnia część artykułu zawiera wnioski i rekomendacje.

Słowa kluczowe: bank centralny, strategia, polityka pieniężna, inflacja, koszty mieszkaniowe, zmiany klimatyczne, test warunków skrajnych

Introduction

The original monetary policy strategy of the European Central Bank (ECB) was adopted in 1998 (just before the introduction of the euro in 1999) and was reviewed in 2003. Since then, the European economy and its environment have changed significantly, prompting the ECB to revise its strategy. In the meantime, climate change and environmental challenges have become issues of growing importance in the European Union (EU).

The central bank's strategy should be relatively stable, but at the same time, it should take into account the changing economic environment to avoid the risk of obsolescence. Therefore, updating the strategy should incorporate elements of both continuity and change. The purpose of this article is to discuss some of the new elements of the ECB's strategy and make their preliminary assessment. The elements of continuity will be presented very briefly as a background for further discussion.

1. Reasons and results of the review of the ECB's monetary policy strategy

The original ECB's monetary policy strategy consisted of the following elements[1]:

- The price stability objective and its "double-key formulation" including both the definition (a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) of less than 2%) and the indication of desirable inflation level in the euro area ("below, but close to, 2%");
- A medium-term orientation of monetary policy;
- The risks to price stability based on the two-pillar (economic/monetary) analysis approach – subject to cross-checking before formulating a unified overall judgement.

At that time, in the early 2000s, the macroeconomic environment in Europe, and in the world, looked substantially different than today. From the ECB's point of view, the most important issue was the fact that several structural developments (such as productivity growth, demand for safe and liquid assets, demographic factors etc.) had lowered the equilibrium real interest rate, i.e. the interest rate at which the economy is operating at its potential (Bundesbank 2017 and 2021; Brand et al. 2018; ECB 2021c).

Moreover, there have been several other developments and shocks experienced by the European economy and financial markets, such as the global financial crisis, the sovereign debt crisis in the euro area, persistently low inflation since 2013 (below the ECB's inflation objective), deployment of unconventional monetary policy measures since 2014 (in order to counter disinflationary pressures), etc. It is also argued that it was clear by the end of 2014 that the euro area had switched over to the so-called second regime, where negative demand shocks came to dominate, and in such circumstances, the 2% ceiling *de facto* ceased to bind and act as a stabilising factor (Rostagno et al. 2019). Last but not least, the COVID-19 pandemic has proved to be a major economic shock to the global economy due to interrupted supply chains (initially, the pandemic put downward pressure on inflation, while recently – strong upward pressure).

The above developments, combined with some other global phenomena (globalisation, digitalisation, climate change, evolving financial structures, communication landscape etc.), have required adequate policy responses. Therefore, in early 2020, the ECB Governing Council decided to launch a review of the ECB's monetary policy strategy. The discussion on the strategy benefited from the broad public consultation process that included several stakeholders and was organized in various forms: listening events (both at the ECB and national central banks), online portals (surveys for the general public), specialist conferences (experts of the

[1] For more details on the original ECB strategy, see e.g. Duisenberg 1998; ECB 1998, 2000 and 2001; Szeląg 2003.

financial sector, academic and research institutions), dialogue with the European Parliament (hearings at the ECON committee[2]) etc. Moreover, the discussion on the strategy also benefited from the reports prepared by several work streams[3]. To some extent, the above consultation process was similar to the one conducted by the Federal Reserve in 2019–2020.

Following the completion of the consultation process, the new monetary policy strategy of the ECB was adopted and published on 8 July 2021. In comparison with the previous strategy of 2003, some elements have been maintained while others modified to some extent. The new ECB's strategy is based on the following elements (ECB 2021c):

- **Measurement of the price index:** The headline HICP remains the proper index to measure euro area inflation[4], but it could be further improved by including some new elements in its scope (particularly owner-occupied housing).
- **Quantitative and symmetric inflation target:** A specific inflation target of 2% has been adopted[5]. The previous approach, i.e. double-key formulation, has been abandoned. It was perceived as asymmetric and led to some ambiguity about the actual level of the inflation objective (the level of 2% was interpreted as a ceiling). An inflation target must be unambiguous and this may be achieved if a symmetric target is applied.
- **Medium-term orientation of monetary policy:** This approach has proved its effectiveness and it will be maintained. It ensures flexibility in responding to economic shocks, eliminates temporary or one-off events, takes into account lags of monetary policy transmission, etc.
- **Proportionality assessment of monetary policy decisions:** As before, it will be based on two separate pillars (economic analysis / monetary analysis), but the scope of the second pillar will be broader (monetary and financial analysis) and there will be no longer cross-checking between both pillars.

2 Committee on Economic and Monetary Affairs at the European Parliament.

3 Work stream on climate change, Work stream on digitalisation, Work stream on employment, Work stream on Eurosystem modelling, Work stream on globalisation, Work stream on inflation expectations, Work stream on inflation measurement, Work stream on macroprudential policy, monetary policy and financial stability, Work stream on monetary-fiscal policy interactions, Work stream on monetary policy communications, Work stream on non-bank financial intermediation, Work stream on productivity, innovation and technological progress, Work stream on the price stability objective.

4 The assessment of the appropriateness of the HICP was based on four criteria: timeliness, reliability (e.g. infrequent revisions), comparability (over time and across countries), and credibility. The same criteria were also applied in the previous strategy review conducted in 2003 (Issing 2003; ECB 2021c). See also the criteria used to adopt the original strategy of 1998 (EMI 1997a and 1997b; Szeląg 2003).

5 It is also argued that the inflation objective should be slightly higher than 2% and the ECB should announce periodic reviews of its inflation objective (Reichlin et al. 2021). After the global financial crisis, some economists suggested that the inflation target should be raised to 4% (Blanchard et al. 2010), and recently, similar ideas have become popular again keeping in mind soaring inflation and current inflation expectations.

Apart from the above-mentioned issue of owner-occupied housing, another novelty is the decision of the Governing Council to involve the ECB in matters relating to climate change and its impact on the economy and monetary policy. Moreover, an important new element of the monetary policy strategy is also its periodical review (the next review is expected in 2025).

2. Improving the measurement of inflation – housing costs

As mentioned in the previous section, one of the conclusions from the review of the ECB's monetary policy strategy is that the headline HICP remains the proper index to measure euro area inflation for monetary policy purposes. At the same time, however, it has been concluded that the HICP should be enhanced by including some new components in this index – particularly, owner-occupied housing (OOH) since the costs of living in private homes represent an important element of household consumption (ECB 2021c and 2021e).

As a matter of fact, it should be noted that the OOH issue, which is currently under consideration, has a fairly long history. In 1997, when the HICP was published for the first time, there were also the first attempts to construct an OOH index based on the net acquisition approach (see Table 1), but some serious problems were identified as to the practical implementation of such an index in the Member States[6]. In 2000, Eurostat launched a pilot program aimed at encouraging the Member States to explore the feasibility of compiling such an index. In 2013 and 2016, the EU institutions adopted two regulations in this regard – one of them provided a legal basis for the compilation of a quarterly OOH index based on the net acquisition approach (Commission 2013), and the other one introduced requirements to compile and disseminate this index (European Parliament and Council 2016). The latter regulation also required the Commission to prepare, by the end of 2018, a report assessing the suitability of the OOH price index for integration into the coverage of the HICP (Commission 2018).

In the context of the planned integration of housing costs into the HICP, two aspects should be mentioned at the outset. First, legal requirements as to the HICP. According to the above-mentioned regulation of 2016, the HICP *"shall be based on the price changes and weights of products included in the household final monetary consumption expenditure"*, i.e. it should be focused on monetary transactions and consumption purposes. Moreover, the same regulation obliges Member States to provide Eurostat with the HICP and its respective sub-indices at monthly intervals.

[6] The main problems behind this exclusion were the lack of a harmonised EU methodology and the lack of relevant data in all Member States. Housing costs are included in the national CPI in Germany, but they are not included in other countries, e.g. in Belgium, France, Italy and Spain. Germany has always advocated for harmonising the OOH measurement and integrating it into the HICP (Bundesbank 2021). On the other hand, it is argued that housing costs are included in the inflation rates of most developed countries in the world (Gros and Shamsfakhr 2021).

Second, the definition of housing costs and their significance. These costs are associated with various aspects of living in one's own home (purchasing, owning, maintaining, etc.). At the moment, the HICP includes only some price changes related to living expenses (costs of maintenance, minor repairs, and other running costs for both tenants and owners[7]), while in general housing costs represent a substantial share (about 13%) of households' consumption in the euro area (ECB 2021e). However, the opinions are divided as to the significance of housing costs. Some authors believe that such costs are very helpful and important in predicting consumers' inflation perceptions (Döhring and Mordonu 2007; Abildgren and Kuchler 2019; Zekaite 2020), while some others perceived housing costs as rather irrelevant in this regard (Aucremanne et al. 2007; Del Giovane et al. 2009). There are also views that the inclusion of housing costs into the HICP may have a different impact on individual euro area countries (Dany-Knedlik and Papadia 2021).

There are several approaches to the measurement of housing costs (OOH) in a consumer price index (see Table 1). The most important ones are:

- **the net acquisition approach**,
- **the use approach** (covering the user and rental equivalence approaches),
- **the payment approach**.

As argued by Eurostat, all these approaches are conceptually sound and based on economic theories. All of them have advantages and disadvantages depending on the formula of the index and user needs as to inflation measurement. Nevertheless, keeping in mind the key features of the net acquisition approach (expenditures associated with actual monetary transactions, no need for imputed prices, etc.), this approach has been regarded as the most relevant one for the HICP purposes (Eurostat 2017).

According to the European Commission, there are two key criteria for assessing the suitability of the OOH price index for inclusion into the HICP:

- conceptual – the need to cover actual monetary transactions and the issue of including assets into the scope of the HICP (dwelling structures, land[8]);
- practical – the feasibility of producing an index according to HICP standards of frequency and timeliness (at monthly intervals).

[7] According to the ECB, the average weight of rents paid by tenants to owners amounts to about 7% in the euro area (and about 10% in the Netherlands and Germany).

[8] Currently, the OOH price index takes into account the full transaction price related to purchasing dwellings, i.e. the dwelling structure and the underlying land. In theory, a potential solution for the OOH price index could be excluding the land component from the index weights and prices, but in practice it would be very difficult (Eurostat 2017; Commission 2018).

Table 1. Key approaches to the measurement of OOH costs

Primary purpose of the price index (CPI)	OOH price definition underlying the approach	Items included in the price indices	Comments
Acquisition			
Measure the change through time of the total expenditure associated with all monetary transactions made by households to acquire goods and services for consumption purposes	Acquisition cost of a dwelling made by a household for own occupancy	• Cash spent on the purchase of dwellings • Local authority and other fees related to purchase or construction • Major repairs and maintenance • Insurance connected with dwellings	Approach more in accordance with the definition of an 'inflation index'. No need for imputed prices.
Use			
Measure the change through time of the total value of all goods and services consumed by households	The opportunity cost associated with the use of a dwelling by a household for its own purpose	• Repairs and maintenance • Insurance • Local authority and other fees related to purchase or construction • Mortgage interest payments • Depreciation of dwellings • The opportunity cost of alternative investments	Approach more in accordance with the Cost-Of-Living Index (COLI) framework. Need for imputed prices.
Payment			
Measure the change through time of the total payments made for all goods and services by households	Cash outlays associated with the owner-occupied dwelling	• Cash spent on the purchase of dwellings • Local authority and other fees related to purchase or construction • Insurance connected with dwellings • Repairs and maintenance • Mortgage interest payments • Mortgage repayments	Approach more appropriate for the evaluation of money income (as well as for COLI). No need for imputed prices.

Source: Own elaboration based on Eurostat (2017).

As to the first criterion, it is partially satisfied by the OOH price index, i.e. the index is focused on actual monetary transactions, but the inclusion of the cost of purchasing dwellings (both structures and underlying land) into the scope of HICP is quite controversial. Opinions on whether the cost of the structure and the cost of the land should be regarded as consumption expenditures (and thus included in a consumer price index) or as assets (and thus excluded from its coverage) are divided even in official national statistics. As far as the second criterion is concerned, the HICP is compiled every month and released 15 days after the end of the reference month, while the OOH price index is produced every quarter and released 100 days after the end of the reference quarter. All in all, the Commission assessed that the OOH price index was not suitable for integration into the scope of the HICP (Commission 2018).

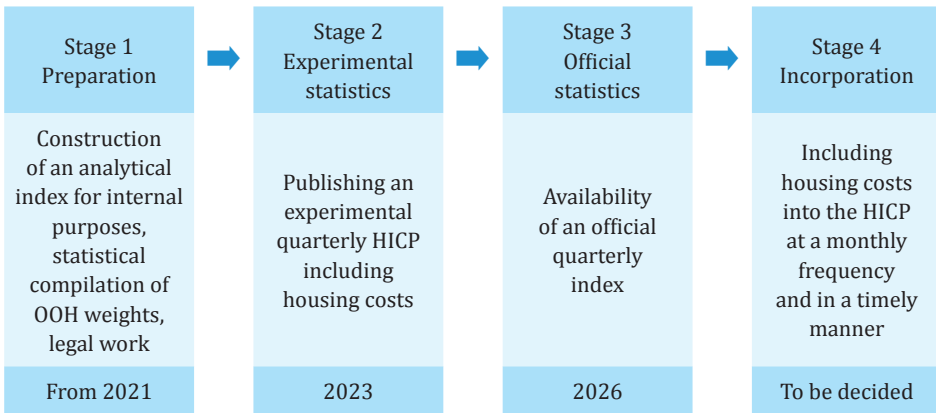
Being aware of the above opinion of the European Commission, and considering that the quality of HICP as an inflation measure has been continuously improved by Eurostat together with statistical offices of the EU Member States[9], the ECB is of the view that the HICP needs to be further enhanced as there is no convincing evidence that the HICP measurement bias has been noticeably reduced since the last strategy review (ECB 2021e). In the Governing Council's opinion, this enhancement could be achieved by the inclusion of housing costs into the scope of the HICP, which would result in an augmented index (HICP-H). It would improve both representativeness of the HICP and its cross-country comparability (as the significance of OOH costs varies significantly across countries in the euro area).

As regards the new formula of the price index (HICP-H), two main options have been explored in the report prepared during the recent review of the ECB's monetary policy strategy, i.e. the NA approach (net acquisition) and the RE approach (rental equivalence). The former is based on actual transaction prices for the purchase of new dwellings while the latter uses imputed housing costs based on rents of other comparable dwellings. Having analysed the pros and cons for both options, the authors of the report concluded that the NA approach could be a good basis for including housing costs into the HICP – keeping in mind that Eurostat already publishes quarterly OOH price indices (OOHPIs) based on this approach (for euro area countries). This could be a starting point for further work towards the above HICP-H (the HICP index augmented with Eurostat's OOHPIs). However, it should also be noted that OOHPIs do not match the quality of HICP in terms of frequency (as they are quarterly rather than monthly) and timeliness (much bigger publication lags in the case of OOHPIs) (ECB 2021e). On the other hand, there are opinions that the rental equivalence approach – similar to the one used in the United States – would be better than the net acquisition approach (Whelan 2021).

[9] The quality of HICP has been improved in several ways: representativeness of actual changes in prices, comparability across time and countries, publication in a timelier manner, data availability, etc. (ECB 2021e).

The Governing Council has recommended a four-stage roadmap to include housing costs into the HICP (see Figure 1). The final stage is expected to allow moving to a modified HICP (HICP-H) as the main index for monetary policy in the euro area. In the meantime, during the transition period, the quarterly OOH index would be treated as an important supplementary measure for assessing the impact of housing costs on inflation (ECB 2021c). It is expected that the OOH component would account for about 10% of the modified HICP (Bundesbank 2021). There are also opinions that the actions envisaged in the ECB's timetable should be accelerated due to the strong inflationary pressure resulting from the pandemic (Bonatti and Fracasso 2021).

Figure 1. Roadmap for including housing costs (OOH) into the HICP



Source: Own elaboration based on ECB (2021c).

3. Central banks and economic impact of climate change

A comparative analysis of the new ECB monetary policy strategy with the previous strategies of 1998 and 2003 shows that the changes introduced are mainly of an evolutionary rather than revolutionary nature. What is a significant novelty is the inclusion of climate issues in the monetary policy decision-making process (within the scope of the ECB's mandate[10]). Such an approach is in line with the EU climate policy but it is sometimes considered controversial.

[10] Article 127 of the Treaty on the Functioning of the European Union (on the ESCB's primary objective of maintaining price stability) refers to Article 3 of the Treaty on European Union that indicates key objectives of the EU – one of them is *"a high level of protection and improvement of the quality of the environment"*. Therefore, contributing to this objective may be regarded as one of the secondary objectives of the ECB/ESCB (without prejudice to the primary objective).

As mentioned before, the discussion on the new monetary policy strategy of the ECB benefited from the reports prepared by several work streams. One of them was the Work stream on climate change. In their report (ECB 2021f), the experts of that work stream provided several arguments – both in favour and against the involvement of central banks in dealing with climate-related issues. As argued in this report, climate change may affect the overall macroeconomic situation (economic activity, inflation, financial markets, etc.) mainly through two channels:

- **physical risk** – from gradual global warming, extreme weather events, natural or environmental disasters (hurricanes, floods, heatwaves, droughts, etc.);
- **transition risk** – from reducing emissions and gradually increasing carbon prices (the latter may incentivise investment in low-carbon technologies).

As regards the impact of climate change on the EU economy, there is a high degree of uncertainty as well as diverse views and results of analyzes in this regard. Both empirical and theoretical studies suggest that economic losses stemming from climate change will increase over time (notably, in the long term) and they will be unevenly distributed across the population, regions, industries, etc. Theoretical studies on the physical effects of climate change indicate stronger negative effects on global GDP, but their results vary significantly depending on the scenario – long-term losses in global GDP are estimated between 1% and 62% (Dietz and Stern 2015; Nordhaus 2017). Empirical estimates suggest that climate change will likely have a limited impact on Europe and its economy over the next few decades, although the impact will differ for individual countries. Estimates indicate that climate change would generate some welfare/income losses or real GDP per capita losses – from about 1% to 7% depending on the scenario (Tol 2018; Kahn et al. 2019 and 2021). The regional distribution of losses is expected to be several times greater in southern Europe than in its northern part (ECB 2021f).

As far as the impact on inflation is concerned, extreme weather events affect mainly food prices, but also energy demand and supply, which in turn also affect prices. Some authors argue that natural disasters have had a limited impact on advanced countries and substantial on developing countries (Parker 2018). Other authors find that very hot summers have a substantial impact on prices in the medium-term perspective (ECB 2021f).

Climate change may lead to migration with effects on health and mortality, which, in turn, may have implications for labour supply and productivity or structural unemployment (Seppänen et al. 2006; Heal and Park 2016; Hsiang et al. 2017; Bamber et al. 2019). Other authors, however, do not find a strong connection between climate change (e.g. temperature shocks) and labour productivity (Letta and Tol 2019).

Extreme weather events may also put a burden on public finances, but empirical studies suggest rather limited budgetary effects (Heipertz and Nickel 2008; Lis and Nickel 2010; Melecky and Raddatz 2011). Those effects could be noticeably reduced by taking precautionary measures (Catalano et al. 2020). In addition to extreme

weather events, delayed transition is also a factor that may result in a negative impact on public finances in the long term in comparison with orderly transition (ECB 2021f).

Experts identify several channels of impact through which climate change may potentially affect the European economy. In this context, they indicate potential supply shocks (food, energy, capital stock, technology), demand shocks (energy, investment, consumption, trade), and aggregate impact on output and nominal variables (GDP, wages, inflation) (Batten 2018). It is also argued that climate risks may affect the transmission of monetary policy via financial markets and the banking sector. The main channels in this respect are interest rate, credit (bank and non-bank lending), asset prices, exchange rate, and expectations (see Table 2).

Table 2. Monetary policy transmission: potential impact of climate change

Channels	**Physical risk** from more common extreme weather events and persistent warming	**Transition risk** from carbon pricing and reducing emissions
Interest rate channel	Non-interest cost factors become more relevant, lowering investment and saving response to interest rate changes.	Uncertainty about timing and speed of policy response raises risk premia and volatility. Natural rate of interest affected.
Credit channel	Financial losses reduce borrower net worth, bank collateral and profitability. Non-performing loans constrain credit supply. Uncertainty reduces market funding of banks.	Financial losses reduce borrower net worth, bank collateral and profitability. Non-performing loans constrain credit supply. Uncertainty reduces market funding of banks.
Asset price channel	Physical risks destroy capital and residential property. Financial losses lower firm valuations.	Demand shifts across sectors and regions. Stranded assets.
Exchange rate channel	Devaluation incentive for short-term competitiveness gain. Higher volatility.	Carbon border adjustment may disrupt trade routes and global value chains.
Expectations channel	Monetary policy less predictable since shock persistence uncertain, blurring supply/demand.	Time-inconsistent transition policies reduce monetary policy credibility and effectiveness of forward guidance.

Source: ECB (2021f).

There are several constraints faced by central banks when tackling climate change. The most important ones can be summarised as follows (Boneva et al. 2021):

- **Risk of interference with the primary mandate.** Most central banks do not have any explicit reference to environmental sustainability in their mandates, which raises doubts about whether they have the legitimacy to use their monetary policy tools to support sustainability-related objectives (Dikau and Volz 2021). Several central banks have an indirect mandate to support the policy objectives of their governments, but there are doubts of whether this is sufficient for central banks to play an active role related to climate change (Solana 2018; Schoenmaker 2021).
- **Endangering independence or overstepping competence.** Challenges stemming from climate change have a clear political dimension and therefore politicians (who are elected and accountable to their voters) are better placed than central banks to deal with climate-related issues, organize necessary debates in civil society (e.g. on changes in production and consumption habits), etc.
- **Distortions in the financial markets.** It is argued that "greening" monetary policy may distort financial markets, notably keeping in mind the current shortage of so-called green bonds (Schnabel 2020 and 2021). There is a lack of commonly accepted market standards of what is "green" or "polluting" investment. Central banks could develop their internal definitions and classifications, but they could be accused of arbitrarily discriminating or favouring some sectors over others.
- **Public criticism on granting excessive power to the central bank.** If central banks communicate publicly on the urgency of "greening" the financial system, it may be perceived as an attempt to accumulate more tasks and powers by them.
- **Fuelling excessive expectations.** If central banks publicly present themselves as leaders in climate matters, they risk fuelling excessive expectations about what they can actually achieve. There are doubts of whether the monetary policy could help tackle climate change. Some recent papers suggest that actions taken by central banks have a very limited impact on reducing emissions and achieving climate goals (Ferrari and Nispi Landi 2020; Ferrari and Pagliari 2021).

The awareness of the above constraints could lead to agreeing that governments should play a leading role on climate matters while central banks could play a supporting role. It is argued that even if monetary policy alone cannot contribute to tackling climate change, it could help accelerate the "green transition" – notably, if supported by fiscal policy, regulation, etc. (Annicchiarico and Di Dio 2015; Ferrari and Pagliari 2021; Benmir and Roman 2020; Boneva et al. 2021).

4. Commitment of the ECB to climate matters

Keeping in mind the above pros and cons, the Governing Council believes that the ECB and the Eurosystem should be involved in climate-related issues since this is currently a key global challenge and a priority area of the EU policy (notably, after the adoption of the European Green Deal in December 2019). At the same time, the

Governing Council admits that governments have the primary responsibility and relevant tools for addressing climate change and its effects. Nevertheless, the ECB and national central banks should not be excluded from the implementation of the adopted programs as physical and transition risks related to climate change may affect price stability, monetary policy transmission, financial stability, assets of the Eurosystem's balance sheet, etc. (ECB 2021c).

The ECB intends to improve its macroeconometric models – rich in economy-related data but lacking climate-related ones and operating over much shorter horizons than is needed for climate analyses. In this context, it should be added that most central banks do not have frameworks that integrate macroeconomic and climate models in a single tool, but some of them[11] have started to develop such tools in order to better understand the macroeconomic effects of climate risks (ECB 2021f).

In July 2021 – together with the new monetary policy strategy of the ECB – the Governing Council announced its climate-related action plan accompanied by a detailed roadmap for 2021–2024 (ECB 2021d). The action plan and roadmap outline the most important actions of the ECB aimed at appropriately reflecting climate change considerations in its monetary policy. Moreover, at the beginning of 2021, the ECB set up a climate change centre (ECB 2021a). The centre is to coordinate the relevant climate-related activities both internally (within the ECB) and externally (within the Eurosystem). These activities of the centre will focus on the following issues:

- macroeconomic modelling and assessing effects for monetary policy transmission,
- statistical data for risk analyses on climate change,
- disclosures as a prerequisite for eligibility as collateral and asset purchases,
- enhancement of risk assessment capabilities,
- collateral framework[12],
- corporate sector asset purchases[13].

One of the key elements of the above-mentioned action plan and roadmap is the ECB's economy-wide climate stress test – aimed at assessing the resilience of European and global firms and banks to physical and transition risks (on the basis of several assumptions on future climate policies). The scope of the stress test has substantially expanded in comparison with the previous tests – this year it covered 4 million firms worldwide and 1600 consolidated banking groups in

[11] For example, the Bank of England, Bank of Canada, De Nederlandsche Bank, Banque de France (see Scott et al. 2017; Ens and Johnston 2020; Vermeulen et al. 2018; Allen et al. 2020).

[12] In September 2020, the ECB decided that bonds with coupons linked to sustainability performance targets would become eligible as central bank collateral from 1 January 2021 (ECB 2020).

[13] In February 2021, the Eurosystem central banks (including the ECB) agreed on common stance for climate-related sustainable and responsible investment principles for euro-denominated non-monetary policy portfolios (ECB 2021b). It will be complemented by the first quarter of 2023, when the ECB is to start disclosing climate-related information of the corporate sector purchase programme (CSPP).

the euro area. Its results were published by the ECB in September 2021. They may be summarised as follows: there are benefits for the early preparation for climate change, the effects of climate risks may concentrate in some geographical areas and sectors, physical risks are to increase over time if policies on the transition towards a greener economy are not introduced, the impact on banks' expected losses may be rather severe and mostly driven by physical risk (Alogoskoufis et al. 2021).

The methodology and results of the ECB's economy-wide climate stress test will be beneficial for two important events in 2022. One of them is the climate stress test of the Eurosystem's balance sheet – aimed at assessing its risk exposure to climate change. Another event that is to benefit from the ECB's economy-wide climate stress test is the supervisory climate stress test for individual banks (those directly supervised by the ECB) – called the Climate Risk Stress Test (CST)[14]. One of its main goals is to develop the capacity of banks and supervisors to identify and assess climate risk. According to the methodology announced by the ECB in October 2021 (ECB 2021g; Walter 2021), the exercise will be conducted from March to July 2022 and it will consist of three separate modules:

- an overarching qualitative questionnaire,
- climate risk metrics (peer benchmark analysis),
- bottom-up stress test projections.

The modules have been presented in more detail in Table 3.

The implementation of the ECB's action plan will be in line with progress on the EU policies and some recent initiatives on information disclosure and classification as well as reporting on environmental sustainability. In particular, it takes into account:

- Disclosures Regulation (adopted in November 2019) – laying down sustainability-related disclosure obligations in the financial services sector (Commission 2019);
- Taxonomy Regulation (adopted in July 2020) – setting out conditions that an economic activity has to meet to be qualified as environmentally sustainable (Commission 2020);
- Corporate Sustainability Reporting Directive (proposal adopted in April 2021[15]) – laying down EU rules requiring large companies to publish regular reports on the social and environmental impacts of their activities (Commission 2021).

[14] It is also called the 2022 ECB Climate Risk Stress Test (since the ECB is to be a coordinator of the exercise) or the 2022 SSM Climate Risk Stress Test (since the exercise is to be conducted within the Single Supervisory Mechanism). The SSM is the system of banking supervision that comprises the ECB and the national supervisory authorities of the euro area countries. The ECB directly supervises 113 significant banks of the euro area countries, and these banks hold about 82% of banking assets in these countries (ECB 2021h).

[15] In December 2021, the Commission's proposal was discussed in the European Parliament. The CSRD is to be adopted by the end of 2022 and enter into force in 2023 (provisional timetable).

Table 3. Methodology and scope of the 2022 Climate Risk Stress Test

Module 1 Overarching qualitative questionnaire	Module 2 Climate risk metrics (peer benchmark analysis)	Module 3 Bottom-up stress test projections
Aimed at assessing how banks build their climate stress test capabilities for use as a risk management tool. In principle, the questions in this survey concern qualitative information on the institution's current practices, i.e. based on the bank's *status quo* at the point in time when the stress test is performed. The questionnaire comprises 11 blocks. Blocks 1 to 10 concern the day-to-day internal stress testing framework of the bank. Block 11 concerns the assumptions developed by the bank in the context of the 2022 CST exercise.	Aimed at comparing banks across a common set of climate risk metrics. The metrics are to assess exposures of banks to emission-intensive companies (how much banks rely on income from carbon-intensive industries and what volume of greenhouse gas emissions are financed by banks). Banks are asked to split their corporate exposures between 22 industries. They are also asked to provide information in an accompanying explanatory note on actions the bank has taken in the past to finance the green transition.	Concerning physical and transition risks. Aimed at assessing how extreme weather events would affect banks over the next year, how vulnerable banks are to a sharp increase in the price of carbon emissions over the next 3 years, how banks would respond to transition scenarios over the next 30 years, etc. The stress test considers the impact of transition risk based on credit risk and market risk. A static balance sheet is to assess the short-term vulnerabilities, while a dynamic balance sheet is for the long-term strategy.

Source: Own elaboration based on ECB (2021g) and Walter (2021).

Concluding remarks

The previous review of the ECB's monetary policy strategy was carried out 18 years ago. During that period of time, many important economic events took place in the world and the macroeconomic environment has considerably changed. The 18-year period of implementing the strategy in the context of turbulent economic events naturally required its review and verification. It also constitutes a premise for more frequent reviews in the future, e.g. at about 5-year intervals, which does not exclude *ad hoc* reviews due to the occurrence of critical events in the economy. This would be in line with the approach of the Federal Reserve, which – having completed a review of its monetary policy strategy – announced in 2020 that it would publicly review it roughly every 5 years.

The changes made to the ECB's monetary policy strategy in 2021 imply a balanced approach that combines both continuity and change. The key elements of the strategy have been maintained or slightly modified while some improvements and novelties have been proposed too.

As regards the changes, a very important one is the decision of the Governing Council to integrate the costs of living in private homes (owner-occupied housing – OOH) into the coverage of the HICP. Housing costs represent a substantial share of households' consumption in the euro area, but the HICP includes only some price changes related to living expenses. Therefore, the inclusion of housing costs into the HICP would improve both representativeness of the HICP (as spending on housing is a substantial part of consumer expenses) and its cross-country comparability (as the importance of housing costs differs markedly across euro area countries).

This is a challenging task given the lack of relevant data in some Member States, which are needed for a harmonised EU methodology. However, Eurostat already publishes quarterly OOH price indices (OOHPIs), which could be a starting point for further work towards the augmented HICP as well as on the procedures for its calculation and publication (frequency and timeliness). Due to methodological and organizational challenges, the ECB proposed a 5-year roadmap for work on this issue. Housing costs should be included not only in the euro area's HICP but also in the national CPIs, notably in those Member States where they have not been included yet. It would ensure better harmonisation between the HICP and CPIs.

Despite the indicated balanced approach to updating the monetary policy strategy, the inclusion of climate issues in the scope of this policy is a completely new or even innovative element. It enhances the coherence of EU and ECB policies in this area, although it is sometimes considered quite controversial since monetary policy itself cannot affect greenhouse gas emissions. Moreover, there are opinions that challenges stemming from climate change have a clear political dimension and thereby politicians (who are elected and accountable to their voters) are better placed than central banks to deal with climate-related issues. There are also other constraints faced by central banks when deciding to tackle climate change, such as the risk of interference with the primary mandate, generating distortions in the financial markets, fuelling excessive expectations, etc. Therefore, central banks should be careful as to their involvement in climate matters.

On the other hand, environmental and climate challenges increasingly affect the overall macroeconomic situation and even the existence of the population of specific regions or continents. Reaching a consensus on these issues is hampered by the lack of agreement as to the scale of threats, the pace of their materialization, and the diverse situation of individual countries or continents in terms of their potential to counter those threats. This also applies to the lack of a single position of the EU Member States. Regardless of the disagreement on the above issues, two specific channels of impact are being indicated – physical risk (extreme weather events, natural or environmental disasters, etc.) and transition risk (growing regulatory costs of greenhouse gas emissions). Against this background, the role of

the national central banks and the ECB needs to be defined in terms of supporting relevant government actions.

The subsidiary nature of the functions and tasks of central banks and the ECB may be based, inter alia, on their substantial research and analytical potential, including their databases. It is worth mentioning that the ECB intends to improve its macroeconomic models, develop its climate models, and integrate these two types of models in a single tool. This is important since most central banks do not have such integrated tools. Another interesting undertaking is the climate-related stress tests planned for 2022 – to be conducted among banks supervised by the ECB. Such exercises look interesting provided that they are not too burdensome for participating entities. It is worth considering whether the results of this exercise would be useful for other stakeholders (the EU institutions, national parliaments and governments, universities and research institutions, etc.).

There is a specific climate-related issue that should be carefully examined by the ECB and national central banks, i.e. the actual and potential impact of EU climate policy on inflation (European Green Deal, Fit for 55, etc.). The consequences of EU programs and actions to tackle climate change must be properly assessed – taking into account not only ecological aspects but also social and economic capacity to absorb the required expenditures as well as their appropriate distribution in time and space. This is related to the scale of inflationary processes as a result of the implementation of the so-called green transformation (rising costs of emissions, pressure on introducing green technologies, ban on using fossil fuels, etc.). This phenomenon is known as "green inflation" or "greenflation". In this context, it is especially important to highlight the problem of the rapidly growing prices of emission allowances, which significantly affect a large part of the retail and wholesale prices of goods and services in the EU Member States.

Proper communication is the issue of utmost importance for central banks. In the new strategy, the ECB has recognised the need to communicate and explain its decisions and activities as clearly as possible to various audiences – both experts and the general public. The latter are usually not prepared to understand the complicated aspects of monetary policy, but this policy affects their day-to-day life. In this context, some practical examples where proper communication by central banks is necessary should be indicated. First, it should be explained to the general public why the ECB has decided to be involved in climate matters. In particular, the ECB should explain in an accessible way the potential impact of climate change on prices and remind that maintaining price stability is a primary objective of the ECB and other central banks. Second, careful communication will be indispensable in the context of integrating housing costs into the HICP – as it is planned that an experimental quarterly HICP (encompassing housing costs) will be published during the transition period in parallel to the headline HICP, which may be confusing.

Last but not least, it seems that the current review of the ECB's strategy could be an inspiration for other central banks – including those outside the euro area. One of them is the National Bank of Poland (NBP), whose monetary policy strategy

was adopted in 2003 and has not been reviewed since then despite considerable changes in the macroeconomic and political environment. Moreover, the NBP strategy includes numerous references to the then planned Poland's membership in the euro area, which does not reflect the current position of the Polish government. A review of the NBP's strategy would also be advisable due to the currently high inflation that may turn out to be a longer-term trend (as a result of both the pandemic and EU climate policy). Therefore, during the review of the NBP strategy, it would be worth discussing the adequacy of the NBP's inflation target to the current and projected economic situation, as well as other important issues, such as the scope of competences of the Monetary Policy Council and its interactions with the Management Board of the NBP, interdependence of central bank's monetary policy and the economic policy of the government, etc. The strategy review would be a task for the new Monetary Policy Council, whose members (most of them) will be appointed for 6-year terms in early 2022.

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Evaluation of changes occurring in ALM models of banks in Poland after the outbreak of the COVID-19 pandemic***

Summary

The purpose of this paper is to assess the changes in the models of balance sheet structure management in banks in Poland after the outbreak of the COVID-19 pandemic. The main focus is on the changes in the interest rate risk profile in the banking sector, resulting from the low interest rate environment and other reasons after the events of early 2020. The key element of the models, referred to as Asset and Liability Management (ALM) models, is the management of financial result and risk in the banking book (including liquidity and interest rate risk). Lately the large-scale materialization of liquidity risk occurred during the global financial crisis. Since then, the regulatory standards and the tools implementing them have been revised and properly supplemented. In turn, the post-pandemic changes triggered an increase in interest rate risk exposure. The deterioration of financial results, as well as the almost "forgotten" risks turned out to be as severe in their consequences for banks as credit, market or operational risks. This paper evaluates the impact of the change in interest rates after the outbreak of the COVID-19 pandemic on the performance and structure of balance sheets in banks in Poland in terms of adjustment strategies.

Key words: Low Interest Rate Environment, Interest Rate Risk, Asset and Liability Management (ALM)

JEL codes: E43, E58, G01, G21, G28

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Ocena zmian zachodzących w modelach ALM banków w Polsce po wybuchu pandemii COVID-19

Streszczenie

Celem artykułu jest ocena zmian w modelach zarządzania strukturą bilansu w bankach w Polsce po wybuchu pandemii COVID-19. Główny nacisk położony został na zmiany profilu ryzyka stóp procentowych w sektorze bankowym, wynikające ze środowiska niskich stóp procentowych oraz innych przyczyn po wydarzeniach z początku roku 2020. Kluczowym elementem modeli, określanych jako modele Asset and Liability Management (ALM), jest zarządzanie wynikiem finansowym oraz ryzykiem w księdze bankowej (w tym ryzykiem płynności i stopy procentowej). Ostatnio materializacja ryzyka płynności na dużą skalę miała miejsce w czasie globalnego kryzysu finansowego. Od tego czasu normy regulacyjne i narzędzia je wdrażające zostały zweryfikowane a także odpowiednio uzupełnione. Z kolei zmiany zachodzące po wybuchu pandemii spowodowały także wzrost ekspozycji na ryzyko stopy procentowej. Pogorszenie wyników finansowych, podobnie jak „zapomniane" niemal ryzyko okazały się równie dotkliwe w skutkach dla banków, jak ryzyko kredytowe, rynkowe czy operacyjne. W artykule dokonano oceny wpływu zmiany stóp procentowych po wybuchu pandemii COVID-19 na wyniki i strukturę bilansów w bankach w Polsce w ujęciu strategii dostosowawczych.

Słowa kluczowe: środowisko niskich stóp procentowych, ryzyko stopy procentowej, zarządzanie aktywami i pasywami

Introduction

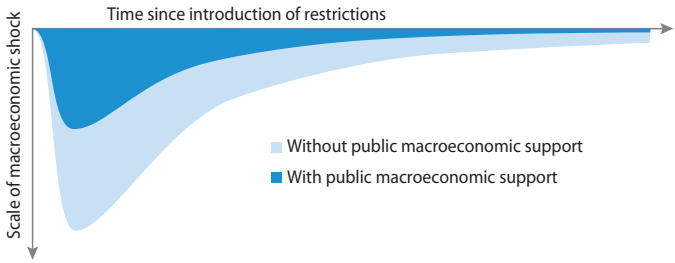
On 11 March 2020 the World Health Organization (WHO) declared a pandemic of the COVID-19. After a brief period without a response, the governments of the affected countries, including Poland, began to gradually declare states of epidemic emergency and then states of epidemic concern. This resulted in the introduction of many restrictions. Generally speaking, this included a prolonged shutdown of the economy and the emergence of an economic recession (see Sułkowski 2020). In order to mitigate the negative consequences of such a situation, the authorities of individual countries implemented aid programmes and central banks applied extraordinary monetary policy measures, such as interest rate cuts, liquidity instruments, credit support programmes, asset purchase programmes, and interventions on the foreign exchange market. The significance of these actions is illustrated by the portrayed significant impact of the pandemic on the economy (Figure 1) included in a special report issued by the NBP (2020).

In Poland, as in other countries using direct inflation targeting in monetary policy, interest rate cuts were introduced first (Niedźwiedzińska 2020). In 2020, for the first time since 2015, despite the persistence of higher levels of the inflation rate[1]

[1] The annual consumer price index for 2019 stood at 102.3 compared to 101.6 in 2018. Source: https://stat.gov.pl/obszary-tematyczne/ceny-handel/wskazniki-cen/wskazniki-cen-towarow-i-uslug-konsumpcyjnych-pot-inflacja-/roczne-wskazniki-cen-towarow-i-uslug-konsumpcyjnych/ (25.10.2021).

and market expectations of an interest rate hike, the Monetary Policy Council (MPC) cut the NBP rates 3 times (on: 18.03., 9.04. and 29.05.), which in the case of the reference rate meant a total reduction of 140 bps. These rates have a direct influence on market interest rates, and thus on interest rates of bank loans and deposits. As a result, interest rates in Poland were at their historically lowest level (Adrianowski 2020), as shown in Figure 2.

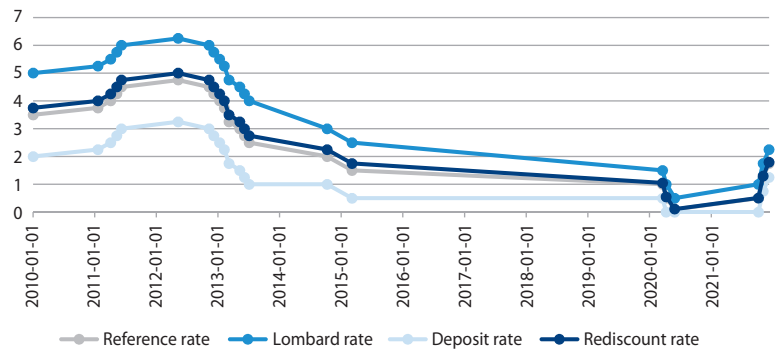
Figure 1. The stylized impact of a pandemic shock on the economy



Notes: the figure presents a stylised impact of the healthcare measures and macroeconomic support measures, and not a forecast of the impact.

Source: Narodowy Bank Polski, *Raport o stabilności systemu finansowego, Wydanie specjalne: skutki pandemii COVID-19*, czerwiec 2020 r., p. 14, https://www.nbp.pl/systemfinansowy/rsf062020.pdf (25.10.2021).

Figure 2. NBP base interest rates in 2010–2021



Source: https://www.nbp.pl/home.aspx?f=/dzienne/stopy_archiwum.htm (25.10.2021).

The low interest rate environment entails various types of multidimensional effects. Although they affect a wide range of stakeholders (Barembruch and Gostomski 2020), they are strongly felt in banking sector institutions (Molyneux et al. 2019) and it is their perspective that is considered in this article. Moreover, the phenomena

and processes that become apparent in the banking sector, which adjusts to low interest rates, have consequences not only for the sector, but also affect society and the economic system as a whole. These include: lowering the cost of financing public debt, increasing the balance sheet totals of central banks, weakening the national currency, lowering the cost of credit for customers, lowering interest rates on deposits, lowering the price of bank shares on the stock exchange, searching for alternative and more profitable ways to invest savings or increased demand in the real estate market.

Of course, not all the effects mentioned above resulted equally from the reduction of interest rates by the Monetary Policy Council. They were also influenced by other aspects resulting from the outbreak of, and concerns about, the consequences of the COVID-19 pandemic, which included: a clear reduction in the demand for investment loans and an increase in the propensity to save, support for enterprises within the framework of the Financial and Anti-Crisis Shield financed from the issue of Treasury bonds or bonds guaranteed by the State Treasury, and a reduction in the level of the reserve requirement[2]. However, regardless of the significance of each above aspect, they have had a broad impact on specific economic sectors, the financial market and their participants, as well as society. In addition, there have been varying degrees of adjustment to the changes taking place.

It is worth noting that an important part of the analysis of the low interest rate environment is looking at the interest rate risk manifested in the activities of banking sector entities (Memmel et al. 2016). Due to the pandemic, there was not only an increase in banks' risk exposure (especially interest rate risk), but also a deterioration in their financial performance. The history of savings and loan associations (S&Ls) can illustrate how strongly a change in rates and the materialisation of interest rate risk can adversely affect the functioning of not only financial institutions, but also the economy as a whole. The bankruptcy of 747 associations with assets worth over USD 407 billion in 1986–1995, referred to as the S&L crisis, was a unique event in the economic history of the United States for many reasons. With the exception of the Great Depression of the 1930s, it was the largest financial crisis of the 20th century. The final cost to taxpayers was estimated at $124 billion. Never before had any sector of the economy experienced such a large and violent wave of bankruptcies, and never before had private institutions forced taxpayers to bear such huge costs.

The above considerations clearly indicate the importance of the problem of low the interest rate environment and other factors affecting the condition of banks after the announcement of the COVID-19 pandemic. Therefore, the aim of this article is to assess the changes occurring in the banks in Poland in the low interest rate environment after the events of early 2020. Attention had been paid to the balance sheet structure management strategies implemented by them, referred to as Asset

[2] Informacja na temat sytuacji sektora bankowego w 2020 roku, KNF, Departament Bankowości Komercyjnej i Specjalistycznej Zespół Analiz Sektora Bankowego, Warszawa, lipiec 2021, p. 5.

and Liability Management (ALM) models, in which two pillars can be identified, i.e. managing the financial result and managing the risk in the banking book[3]. The book most often points to liquidity risk and interest rate risk (IRRBB). The large-scale materialisation of liquidity risk occurred during the global financial crisis. Since then, the tools and standards to monitor them have been revised and effectively supplemented[4]. In contrast, the low rate environment and other post-pandemic changes have triggered a shift in the interest rate risk profile in the ALM space.

Just as the rate management strategy common in banks in the 1960s – the "3-6-3" rule[5] was verified by the market after the collapse of the Bretton Woods system, after the emergence of the crisis related to the COVID-19 pandemic the ALM models underwent such a process. After the outbreak of the pandemic, analogous to the situation that occurred during the global financial crisis with liquidity risk, the "forgotten"[6] interest rate risk turned out to be as severe for banks in its consequences as credit, market or operational risk.

With respect to the analysis conducted and the research objective set, two research propositions have been formulated. (P1) The low interest rate environment negatively affects not only the sensitivity of net interest income (NII), but also the sensitivity of the economic value of equity (EVE). While awareness of the impact of rates on NII is widespread, awareness of their impact on the sensitivity of EVE remains decidedly limited. The changes in the structure of banks' balance sheets following the March 2020 events and the interest rate characteristics of their various positions, as presented in this article, mean that (P2) EVE is now more sensitive to increases than decreases in interest rates. Thus, the NBP rate hikes initiated in Q4 2021 imply a depreciation of economic value of equity. This is unfavourable, since it reflects the real capital needs, and is treated as a buffer to absorb the identified significant risks occurring in the bank's activities and changes in the economic environment (Iwanicz-Drozdowska 2021, p. 227).

Due to the specificity of the research objective, a broad observation of reality was carried out (cf. Apanowicz 2002, pp. 60–77) with regard to the banking sector in Poland in 2020 and the process of collecting financial assets of Poles. In the study of changes in the structure of financial performance of banks, the method of document research was primarily used and – when analysing models of rate risk management – additionally the individual cases method. The use of the individual case method

[3] A bank distinguishes between two books: the banking book and the trading book. The banking book includes all transactions that are not included in the trading book, while the trading book includes the portfolio of assets and off-balance sheet transactions entered to profit from short-term fluctuations in market factors (cf. Nowak 2017, pp. 197–198).

[4] This issue, in a synthetic way, is presented later in the article.

[5] This rule was in effect in American retail banking in the 1950s, 1960s, and 1970s. It involved banks paying 3 percent on deposits and making loans at 6 percent. Because there was no interest rate risk – the bank president could go golfing at 3 in the afternoon (Walter 2006).

[6] In 2007, the term "forgotten risk" was used by A. Clarke, advisor to the Governor of the Bank of England, in relation to liquidity risk. A statement made at a seminar „Financial Stability: Specialist Topics", Bank of England, 30.03.2007: Liquidity is a foregotten risk (see: Hałaj 2008, pp. 14–27).

is due to the limited number of banks that revealed information about changes taking place in this area[7] in their financial statements and other reports[8], and from individual approaches (including presentation) applied by banks in this regard. The analysis was narrowed down to the commercial banking sector. The use of literature review in the analysis and criticism of literature was to some extent limited due to the small comparability (to other countries) of the interest rate environment in Poland and factors affecting it[9].

In addition to this introduction, the article consists of four parts. It starts off with presentation of a review of the subject literature. However, the key part is the analysis of the structure of balance sheets and financial performance of banks in Poland from the perspective of changes that occurred after the outbreak of the pandemic, followed by an analysis of the change in the interest rate risk profile in terms of adjustment strategies to the actions taken in the face of the crisis caused by the pandemic, with particular emphasis on the impact of reduced interest rates. It ends with a summary, including the main conclusions of the analyses.

1. Literature review

Monetary policy in highly developed countries is aimed at price stabilisation, which in the long run has led to a decline in the level of interest rates to values close to zero (Bednarczyk and Brzozowska-Rup 2018). This mentioned level means interest rates at 2 percent and below – even negative interest rates (Rzońca 2014, pp. 19–20). Consequently, in highly developed countries, the banking sector has been operating in a low interest rate environment for several years. Further enforcing the strategy of maintaining low interest rates was observed when central banks responded to the global financial crisis (GFC) by introducing large-scale quantitative easing into monetary policy in order to boost economic growth (Kozak 2016). Following the outbreak of the COVID-19 pandemic, many central banks, including the National Bank of Poland (NBP), continued (or implemented) the above policy. It should be emphasized that the scope of comparisons of the Polish economy to developed countries of the European Union is limited. At some point after the GFC many of them introduced negative interest rates (Rosati 2016).

[7] These are primarily the so-called Bank Disclosures, resulting from Pillar III introduced under the New Capital Accord, which obliges banks to maintain adequate market discipline by mandating them to disclose information about their risk profile and capitalization levels (cf. Zombirt 2007, p. 65–67).

[8] The same approach was presented by Olech and Miszczak (2020), i.e., capital groups that presented information on the levels of bank portfolio risk measures in their 2020 interim financial statements at a level that would allow comparison with end-2019 data were analyzed.

[9] That is, in late 2019, due to rising inflation in Poland, there were isolated forecasts indicating market expectations for interest rate hikes. However, the Monetary Policy Council, after the outbreak of the pandemic, decided to lower them. Por. https://michaelstrom.pl/raporty-i-analizy/artykuly/296/jak-wzrost-stop-procentowych-i-wynagrodzen-wplynie-na-zdolnosc-kredytowa-polakow (20.12.2021).

Due to its consequences, the above-mentioned monetary policy raises doubts (see Rogoff 2017; Heider et al. 2019; Nasir 2021). One of the more outlined problems in this area is the so-called Zero Lower Bound (ZLB), relating to interest rates so low that the central bank loses the ability to stimulate the economy with its rates (Khoury and Pal 2020). However, this assumption is questioned due to the introduction of negative interest rates in some countries and the noticeable lack of weakening of the transmission mechanism in specific cases (see Altavilla et al. 2019).

An important thread in the area of the importance of the low interest rate environment (including the negative interest rate policy) is their impact on the commercial banking sector. As noted by Eggertsson, Juelsrud, Summers and Wold (2019), the literature focuses in this case on several issues, in particular: the impact of interest rates on the deposit rates, on the lending rates and on the bank equity values. Ulate Campos (2019) points to a number of examples of studies devoted to the impact of monetary policy on bank profitability in the context of low interest rates. Another issue raised in the literature (although so far much more often in various trade studies and reports devoted to the banking sector) is the change in the risk profile (especially in the field of interest rate risk) in the face of low interest rates, which translates into the need to change the models of balance sheet structure management in banks. This is pointed out by the authors of publications edited by Gnan and Beer (2015), edited by Bohn and Elkenbracht-Huizing (2018), or in individual works – Chaudron (2016), Deliovorias (2016). However, it seems that the problem is not sufficiently recognized and described, so this article may help fill the gap in this area.

2. Analysis of changes in financial results and balance sheet structure of banks in Poland after the outbreak of the COVID-19 pandemic

The outbreak of the pandemic, actions taken by policy makers and changes in macroeconomic factors directly affected the financial condition of banks and the level of accompanying risks. Despite the implementation of hedging measures by banks, the performance of the banking sector in Poland as well as the level of risk in 2020 are significantly different compared to 2019 and previous years. This section looks at the change in financial performance caused by the above-mentioned factors, which are also reflected in the structure of balance sheets.

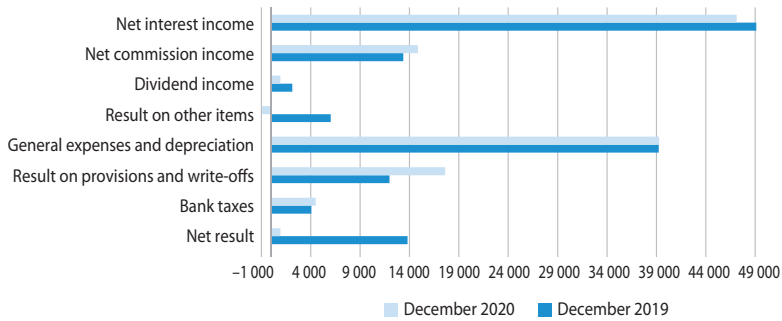
According to information on the situation of the banking sector in 2020, published by the KNF, the net result of banks in 2020 amounted to PLN 932 million. Compared to 2019 it decreased by over PLN 12.8 billion, i.e. 93.3 percent, including the commercial bank sector examined here – by PLN 13.07 billion, i.e. by. 98.7 percent.

Based on Figure 3 it can be concluded that the decrease of net interest income and net other income (down by almost PLN 2 billion and PLN 7 billion respectively) and the increase of provisions and write-downs (by PLN 5.6 billion) had the main

impact on the result. The level of provisions and impairment allowances was mainly influenced by provisions created for risks related to:

(1) the effects of the COVID-19 pandemic (and expectations of deterioration in the quality of the loan portfolio),
(2) the increase in the number of court cases and the value of the subject matter of litigation for CHF mortages (following the CJEU 260/18 judgment of 3 October 2019),
(3) the reimbursement of part of the costs associated with consumer loans repaid before the contractual deadlines consumer loans (following the CJEU judgment 383/18 of September 11, 2019).

Figure 3. Selected income statement items of the banking sector in Poland as at the end of December 2019 and 2020

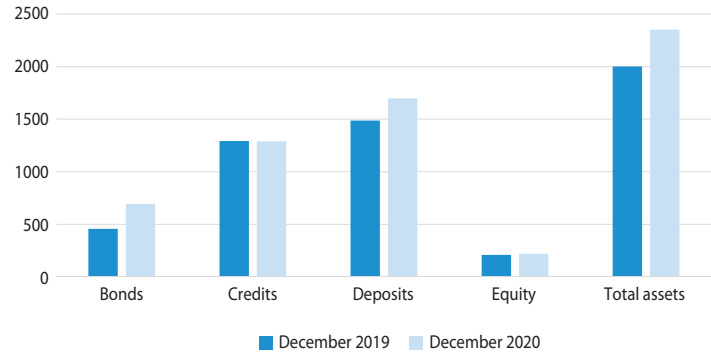


Source: own work, based on: Informacja na temat sytuacji sektora bankowego w 2020 roku, KNF, https://www.knf.gov.pl/knf/pl/komponenty/img/Informacja_na_temat_sytuacji_sektora_bankowego-_w_2020_roku.pdf [30.10.2021].

The deterioration in net interest income, in turn, was a consequence of the reduction in interest rates. In 2020, banks had to flexibly adjust deposit rates to the decline in lending rates. The average interest rates on home loans to households and loans to businesses decreased from 3.7 percent in December 2019 to 2.3 percent in December 2020, while the interest rates on household and business time deposits decreased from 1.4 percent and 1.3 percent in December 2019 to 0.5 percent and 0.3 percent in December 2020, respectively. In 2018–2019, the share of net interest income in banks' total operating income reached almost 70 percent, hence the reduction in net interest income significantly weighed on the low overall financial performance. This reduction was not offset by an increase in net fee and commission income, which increased by almost PLN 1.5 billion in 2020 compared to 2019.

At the same time, the prevailing situation in 2020 not only significantly changed the level and structure of banks' financial results, but also had an impact on the balance sheet and its individual components (Figure 4).

Figure 4. Selected balance sheet items of the banking sector in Poland as at the end of December 2019 and 2020



Source: own work, based on: Informacja na temat sytuacji sektora bankowego w 2020 roku, KNF, https://www.knf.gov.pl/knf/pl/komponenty/img/Informacja_na_temat_sytuacji_sektora_bankowego-_w_2020_roku.pdf (30.10.2021).

In the period under review, a 17.5 percent increase in total assets (over PLN 350 billion) was clearly visible. This growth, resulting from the increase in deposits of both retail and corporate clients (an increase of over PLN 210 billion), financed the increase in debt securities, the volume of which increased by over PLN 237 billion (almost 52 percent) in 2020.

It should be noted that the increase in corporate clients' funds resulted directly from the support of Polish companies affected by the effects of the pandemic in the form of domestic financial disbursements under the Financial Shield and the Crisis Shield[10], as well as a significant decline in corporate lending (resulting from a lower level of investments)[11]. Their increase was therefore temporary in nature, and irrelevant for banks in the long run, and an unstable source of financing. This can be evidenced by the fact that banks not only lowered interest rates for corporate clients in H1 2020[12], but also three of them withdrew their offer to companies.

In the context of the reported increase in retail customer funds at banks, which are stable sources of their funding, it is worth to look at the structure of Poles' financial assets. In order to capture the changes that were a direct response of households to the outbreak of the pandemic, the value of household financial assets will be presented[13] in Poland at the end of 2020 compared to the end of 2019 and

[10] According to the website of The Republic of Poland, the level of funds allocated to companies is: PLN 100 billion from the Financial Shield of the Polish Development Fund S.A. and PLN 104.2 billion from the Anti-Crisis Shield, see https://www.gov.pl/web/tarczaantykryzysowa (13.12.2021).

[11] Informacja na temat sytuacji sektora bankowego w 2020 r., KNF, Departament Bankowości Komercyjnej i Specjalistycznej Zespół Analiz Sektora Bankowego, Warszawa, lipiec 2021.

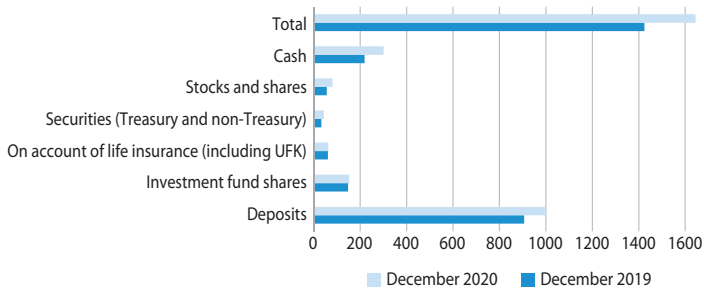
[12] Average corporate rates fell from 0.95 percent in January to 0.11 percent in July and 0.1 percent in December 2020. Cf. Ibidem.

[13] The analysis does not take into account, among others, funds in accounts in OFE or funds transferred by OFE to ZUS in February 2014. (no possibility to freely dispose of them).

the changes taking place, triggered primarily by the outbreak of a pandemic, the reduction in socio-economic activity and the exceptionally low level of interest rates.

According to information presented in the NBP report The Development of the Financial System in Poland in 2020 (NBP 2021), at the end of December 2020 total household financial assets amounted to PLN 1.64 trillion, a year-on-year increase of 15.5 percent. This growth is also confirmed by the results of the InfoKREDYT report (ZBP 2020) commissioned by the Polish Bank Association (ZBP), according to which, at the end of 2020, as many as 35 percent of Poles declared that the post-pandemic situation had increased their propensity to save and decreased their propensity to consume.

Figure 5. Value of household financial assets at the end of December 2019 and 2020



Source: own work, based on: Rozwój systemu finansowego w Polsce w 2020 r., NBP 2021, https://www.nbp.pl/systemfinansowy/rozwoj2020.pdf [21.12.2021].

Analysis of Figure 5 indicates that traditionally Poles accumulate most assets in banks (over 60 percent) and in cash (over 15 percent)[14]. There were also big changes in the level and structure of customer funds in banks. According to the statement of the Analysis Office of the Polish Development Fund S.A. (Kolasa 2021), there is a clear conversion of time deposits (down by almost 34 percent) into current funds (up by more than 30 percent). This phenomenon was a result of lower interest rates and a widespread withdrawal from offering bank deposit by banks[15].

[14] The dynamics of cash growth was the highest at the beginning of the pandemic. It resulted from the fears of Poles about its availability, in connection with the expected restrictions on leaving home and working hours and even closure of bank branches. The highest outflow was recorded in the period from March to May 2020, when the level of cash in circulation increased by PLN 54 billion. In subsequent months, the situation stabilized (NBP 2021).

[15] The number of placements gradually decreased from 486 in January to 407 offerings in December 2020. See Informacja na temat sytuacji sektora bankowego w 2020 roku, KNF, Departament Bankowości Komercyjnej i Specjalistycznej Zespół Analiz Sektora Bankowego, Warszawa, lipiec 2021, p. 41.

Changes in the level and structure of customer funds in banks had implications. Their growth – in view of the freezing of lending – resulted in significant over-liquidity of the banking sector. The high level of corporate clients' funds may have contributed, from the liquidity point of view, to an unfavourable increase in the concentration of deposits[16]. The conversion of time deposits into current deposits reduced interest costs (albeit with their growth and the over-liquidity of the banking sector), but these costs, due to the lack of the possibility of introducing a negative interest rate (discussed later in this article), were still at a relatively high level. At the same time, it should not be forgotten that current deposits are less stable than time deposits, which – as was indicated above – is important in building ALM model strategies.

Due to an increase in the public's propensity to save and the government's support for economic entities as part of the Anti-Crisis Shield, as well as the already signalled reduction in the reserve requirement rate after the outbreak of the pandemic, there was an inflow of funds to banks and an increase in their balance sheet totals. The significant increase in balance sheet totals did not translate into lending[17], but resulted in an increased demand for securities from banks. Banks purchased mainly debt securities offered by the government and specialised institutions (BGK or PFR[18]) (Olech i Miszczak 2020, p. 6), guaranteed by the State Treasury. This can be seen in the information presented by the NBP in its December 2020 Financial System Stability Report. At the end of June 2020, compared to the end of 2019, the value of the portfolio of these bonds in banks increased by 33 percent. Their share in the assets of the banking sector accounted for more than 20 percent of assets, and their value exceeded the banks' own funds almost 2.5 fold. What is also important is that their share in the assets of banks in Poland is at one of the highest levels among the EU countries[19]. While their relatively high share in previous years was due to the introduction of new supervisory prudential liquidity standards[20] (and the demand for treasury bonds in 2020, which in Poland are mainly held in the form of government debt securities), and the existing tax on certain financial institutions, the tax base of which excludes treasury bonds, in 2020 the demand for them resulted mainly from the banking sector's involvement in financing aid from public funds through the purchase of treasury securities and securities

[16] Concentration risk is regulated by Recommendation C regarding concentration risk management, KNF, Warszawa, maj 2016, source: https://www.knf.gov.pl/knf/pl/komponenty/img/Rekomendacja_C_2016_47196.pdf (13.12.2021).

[17] Although gross loans to households increased by nearly PLN 22 billion (i.e. 2.9 percent), loans to businesses decreased by PLN 16.2 billion (i.e. 4.2 percent). At the same time, the quality of loans deteriorated, but may still be underestimated due to the so-called "credit vacations" applied by banks. See: Informacja na temat sytuacji sektora bankowego w 2020 roku, KNF, Departament Bankowości Komercyjnej i Specjalistycznej Zespół Analiz Sektora Bankowego, Warszawa, lipiec 2021.

[18] Raport o sytuacji ekonomicznej banków, BANKI 2020, Nr 11/2021, WIB, na zalecenie ZBP, kwiecień 2021, p. 123.

[19] The banking sector held almost 50 percent of the bond issues issued by the Treasury. See: Raport o stabilności systemu finansowego. Ocena skutków pandemii COVID-19, NBP, Departament Stabilności Finansowej, Warszawa, grudzień 2020 r., p. 15 and 55.

[20] These are the liquidity ratios LCR and NSFR.

guaranteed by the State Treasury. To this regard, it should be borne in mind that the mentioned securities, often with a fixed interest rate, purchased in a low interest rate environment, may produce unsatisfactory financial results in the long term, especially in the materialising perspective of rising interest rates[21].

As one can seen, actions taken after the outbreak of the pandemic, taking into account the low interest rate environment, have a negative impact not only on reducing the financial result (including interest income), but also on the level and structure of the balance sheet, which in turn – together with the interest rate characteristics of individual balance sheet items – has a bearing on the interest rate risk profile of banks.

3. Changes in the interest rate risk profile of banks in Poland after the outbreak of the COVID-19 pandemic

The shielding actions of the economy, including the reduction of interest rates, had, under the ALM models, an impact not only on the performance and changes in the structure of banks' balance sheets, but also on the risk of the banking book. As it was already signaled in the introduction, the book identifies liquidity risk and interest rate risk. The problem of liquidity risk mitigation was regulated after the global financial crisis. This includes the implementation of two prudential standards, i.e., the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR), as well as additional liquidity monitoring metrics (ALMM). In order to ensure a comprehensive and comparable evaluation of the adequacy of the liquidity risk management system by the financial supervisors, the Internal Liquidity Adequacy Assessment Process (ILAAP) was implemented, similarly to the Internal Capital Adequacy Assessment Process (ICAAP)[22], which specifies what information, relevant from the perspective of liquidity and liquidity risk assessment, supervisory authorities should obtain from banks in order to carry out assessments in accordance with the criteria contained in the Supervisory Review and Evaluation Process (SREP) guidelines arising from Pillar II capital requirements. After the outbreak of the pandemic, the decisions made by policymakers and the behavior of customers contributed to deepening over-liquidity of the banking sector[23], and a new challenge became managing intraday liquidity following the MPC's reduction of the reserve requirement level[24], limiting the level of banks' funds on settlement accounts with the NBP.

[21] On 6.10.2021, 3.11.2021 and 8.12.2021 the MPC decided to increase interest rates.

[22] ICAAP and ILAAP are defined in the Guidelines on ICAAP and ILAAP Information Collected for the Supervisory Review and Evaluation Process (SREP), February 10, 2017 (EBA/GL/2016/10).

[23] At the end of 2020, the average LCR in commercial banks reached 193 percent. This phenomenon will not be analyzed further. See: Informacja na temat sytuacji sektora bankowego w 2020 roku, KNF, Departament Bankowości Komercyjnej i Specjalistycznej Zespół Analiz Sektora Bankowego, Warszawa, lipiec 2021.

[24] 17.03.2020 r. Monetary Policy Council lowered the reserve requirement rate from 3.5 percent to 0.5 percent, and 7.10.2020. – increased the reserve requirement from 0.5 percent to 2 percent. The level of the reserve requirement is therefore still below the pre-pandemic level (3.5 percent).

The materialisation of interest rate risk in the banking book may now be much more important. Therefore, the following study assesses whether the changes that occurred after the outbreak of the pandemic, including the reduction of interest rates, have affected the profile of this risk in banks in Poland. Due to the limited and often incomparable presentation of information on interest rate risk management in the banking book in the reports and statements disclosed by banks, the analysis of changes in the IRRBB profile after the outbreak of the pandemic will be carried out on the example of selected commercial banks in Poland. The data presented by these banks and appearing on reports (Olech and Miszczak 2020, p. 8) indicate that the increase in the banking sector's exposure to this risk has been recognised. The analysis of changes in the IRRBB profile will be preceded by a synthetic overview of this risk in order to give an idea of its fundamental aspects.

In accordance with the definition formulated by the European Banking Authority (EBA) in its Guidelines[25], it is the risk of changes in the current and future Net Interest Income (NII) and the market value of the bank's capital under the influence of interest rate changes (Economic Value of Equity (EVE). The impact on earnings is materialised in the impact on net interest income (NII). The market value of a bank's capital, in turn (also called the economic value of equity (Cicirko 2012)), is the value of capital estimated as the difference between the market value of receivables and payables. Thus, the purpose of interest rate risk management in the banking book is to mitigate the opportunity cost and losses incurred as a result of rate changes so that they do not exceed the acceptable sensitivity of interest income and the economic value of equity to interest rate changes[26] (Nowak 2021, p. 313). This is achieved by appropriately structuring the bank's balance sheet, taking into account both changes in the bank and its environment.

From the information published in 2020 by banks in terms of IRRBB, it is clear that after the outbreak of the pandemic the profile of this risk has changed. This is evidenced by the data disclosed on the sensitivity of net interest income (NII) and sensitivity of economic value of equity (EVE) after the outbreak of the pandemic by (for example): PKO BP S.A., BOŚ S.A. and Santander Bank Polska S.A. (Tables 1–3).

Table 1. Measures of interest rate risk of the banking book in PKO BP S.A. in 2020 and 2019

Nazwa miary	31.12.2020	31.12.2019
Sensitivity of interest income (PLN million)	(510)	(901)
Sensitivity of economic value (PLN million)	(454)	(273)

Source: Financial Statements of PKO Banku Polskiego SA for 2020, www.pkobp.pl (25.10.2021).

[25] The Guidelines for the Management of Interest Rate Risk from Banking Portfolio Activities, July 19, 2018 (EBA/GL/2018/02).

[26] In the case of NII sensitivity testing, a change in interest rates by +/- 100 bp. is most often assumed, while in the case of EVE – by +/-200 bp.

Table 2. Measures of interest rate risk of the banking book in BOŚ S.A. in 2020 and 2019

Date	ΔNII		ΔEVE	
	–100 bps	+100 bps	–200 bps	+200 bps
31.12.2020	–95,408	39,378	67,413	–98,089
31.12.2019	–43,737	33,718	29,975	–66,589
Change	–51,671	5,660	37,433	–31,496

Source: Financial Statements of Banku Ochrony Środowiska Spółki Akcyjnej for 2020, https://www.bosbank.pl (25.10.2021).

Table 3. Measures of interest rate risk of the banking book in Santander Bank Polska S.A. in 2020 and 2019

	NII Sensitivity		MVE Sensitivity	
1 day holding period	**31.12.2020**	**31.12.2019**	**31.12.2020**	**31.12.2019**
Maximum	410	298	613	360
Average	334	273	339	194
as at the end of the period	396	292	135	168
Limit	**505**	**355**	**540**	**500**

Source: Financial Statements of Santander Bank Polska S.A. for 2020, https://www.santander.pl (25.10.2021).

The above information indicates that in 2020 versus 2019, the level of these sensitivities has changed. In 2020 versus 2019, in PKO BP S.A. the sensitivity of net interest income decreased by PLN 380 million (i.e. from PLN –907 million to PLN –527 million), while the sensitivity of economic value of equity – increased by PLN 177 million. Changes were also recorded in the other two banks, with Santander Bank Polska S.A. also disclosing a change in the level of appetite/tolerance limits for the IRRBB, i.e. in the case of NII – the limit increased from 355 to 505, while the EVE limit increased from 500 to 540. The change in the level of limits clearly indicates an increase in the exposure of this bank to the IRRBB.

Not only figures, but also descriptions in the banks' financial statements highlighted the fact that the most significant risk of the banking book is interest rate risk. For example, according to the disclosure of Bank Millennium S.A.[27], the exposure to this risk resulted primarily from a mismatch between the repricing dates of receivables

[27] Sprawozdanie finansowe Banku Millennium S.A. za rok zakończony 31 grudnia 2020 roku, www.bankmillenium.pl (25.10.2021).

and liabilities (net of equity), including mainly receivables and liabilities bearing fixed interest rates (or 0 percent). The negative impact of this mismatch on the interest result was exacerbated by the legally established upper limit of the interest rate on consumer loans, which may not be higher than twice the reference rate plus 7 percentage points. In the case of banks significantly involved in this type of lending, due to low and additionally lowered NBP rates (including the reference rate) – the impact on the result is negative[28]. mBank S.A., in turn, reported a complete reversal of the structural position of sensitivity of economic value of equity in 2020, which caused a change in this sensitivity from a decrease to an increase in interest rates. It cited the following as the primary reasons: a significant increase in current account balances (with liabilities to banks up nearly 208 percent and to customers up over 38 percent), with the vast majority of funds from customers characterised by fixed interest rates[29]. The same problem was signalled by Santander Bank Polska S.A., which reported even exceeding internal limits monitoring EVE sensitivity to rate changes in Q2 2020. At this bank it was due to a significant increase in the balance of customer funds (non-interest bearing, no maturity) and the inflow of funds under government assistance programmes implemented in connection with the pandemic. To neutralise the increase in rate risk, this bank increased the scale of investment in fixed-rate securities.[30] Bank Pekao S.A. indicated changes in sensitivity of both NII and EVE, which were also caused by interest rate cuts, increased liquidity of the banking sector (as a reaction to COVID pandemic) and asymmetry of interest rate changes on receivables and liabilities side in scenarios of decreasing / increasing interest rates[31]. The Bank stressed that in order to mitigate this risk, it monitored on changes in the environment, balance sheet structure and product offering and its interest rates[32] an ongoing basis. ING Bank Śląski S.A. also reported increased sensitivity of net interest income in the interest rate decrease scenario (parallel decrease by –125 bps). Due to the reduction of interest rates by the Monetary Policy Council, a minimum level of zero was activated on the customer price in the scenarios of decreasing interest rates (mainly activation at 0 percent on the customer price for retail savings accounts)[33].

[28] According to the aforementioned legal solutions, in March 2020, with the reference rate at the level of 1.5 percent – the interest rate on consumer loans could not be higher than 10 percent, after the last – third rate cut by the MPC in May 2020. – this interest rate dropped to 7.2 percent.

[29] Sprawozdanie finansowe mBanku S.A. według Międzynarodowych Standardów Sprawozdawczości Finansowej za 2020 rok, www.mbank.pl (3.11.2021).

[30] Sprawozdanie finansowe Santander Bank Polska SA za rok zakończony 31 grudnia 2020 roku, www.santander.pl (25.10.2021).

[31] This refers to the impossibility of lowering low or zero interest rates on the liabilities side (assuming no possibility of introducing a negative interest rate) as compared to interest rates on the receivables side, which increases the sensitivity exposure of the interest result. In the event of an increase in rates – such limitations apply only to the above described limitation on the increase in interest rates on consumer loans.

[32] Jednostkowe sprawozdanie finansowe Banku Pekao S.A. za rok zakończony 31 grudnia 2020 roku, www.pekao.com.pl (25.10.2021).

[33] Jednostkowe sprawozdanie finansowe ING Banku Śląskiego S.A. 2020, www.ing.pl (15.12.2021).

A confirmation of the observations reported by banks was also reflected in the reports of institutions related to the financial market. An example is EY's report entitled The situation of the banking sector in Poland after H1 2020, which highlights the significant impact of changes in bank balance sheets (i.e. an increase in current account balances and securities portfolios) on banks' risk profiles. These changes translated into a sharp increase in liquidity measures and sensitivity of economic value of equity, as well as into a trend of decreasing sensitivity of interest income (Olech and Miszczak 2020, p. 8). It is clear from this that the risk profile of the IRRBB has evolved significantly.

Interest rate risk was also recognised several years ago by financial regulators and is now treated as particularly important. This is reflected in the EBA's 2018 Guidelines on the management of interest rate risk from activities included in the banking book. [EBA/GL/2018/02] and in the draft amendment of Recommendation G on interest rate risk management in banks, assumptions of which were adopted by the FSA in February 2019[34]. In addition to studying the impact of rate changes on the financial result and the economic value of equity, supervisors oblige banks to conduct stress tests and model customer behavior. KNF in Recommendation G imposes obligatory monitoring of interest rate risk both in banking books and trading books. The regulator's standpoint on interest rate risk is reasonable, especially in light of the aforementioned example of problems of American S&Ls, where the lack of control over those institutions was mainly to blame, but the primary reason was the lack of awareness of the existence and control of interest rate risk caused by the mismatch between the repricing periods of interest rates on the active and passive side of the balance sheet, or rather – the lack of flexibility in adjusting the interest rate of loans to interest rate changes[35].

Final remarks

Asset-liability management has become increasingly important in banks' business models in Poland, including the adjustment of interest rate changes on the asset and liability side to changes in market rates, the persistent over-liquidity of the banking sector, and the increase in the share of fixed-rate balance sheet items (securities). The impact of these challenges is multidirectional, ranging from changes in the composition of balance sheets, through the reduction of the financial result, to the change in the interest rate risk profile analysed in the article.

Low rates, undoubtedly, have a negative impact on interest margins and net interest income. Therefore, banks have to look for other, non-interest sources of income. They do so by increasing the existing fees and commissions or introducing new ones.

[34] https://www.knf.gov.pl/o_nas/komunikaty?articleId=64612&p_id=18 (1.12.2021).

[35] A similar situation occurred in the case of the collapse of Barings Bank, which, although the main reason was inadequate control, the root cause was a lack of awareness of market risks and their consequences.

These changes take place with strong competition in the financial services market, as well as high expectations as to the protection of consumer rights, naturally meeting customer dissatisfaction. Especially as the latter have become accustomed to so-called cheap banking, are price-sensitive and finally become disloyal, as indicated, inter alia, by systematically conducted research[36]. In response, banks offer new types of services, not only of financial nature, which allow for the diversification of the service portfolio and generate additional income. On the other hand, the very low level of interest rates on deposits, especially in relation to the inflation level, also changes customers' preferences with regard to investing their savings, including increasing the share of current deposits. While this change reduces interest costs, it also requires banks to take a different approach to monitoring and estimating the so-called current account sediment, which is the basis for the transformation of the term of short-term deposits into loans.

Changes in the structure of bank' balance sheets in Poland, in the form of increases in current account balances and a greater share of securities portfolios, translated significantly into the risk profile in the ALM models. It is especially about increasing the liquidity measures and the sensitivities of net interest income and economic value of equity. The net interest income indicates sensitivity to low interest rates in the long term, as well as their decline. On the other hand, limiting lending (characterised by variable interest rates) and the search by banks for sources of greater financial income (e.g. by investing in securities issued by Polish Development Found with fixed interest rates)[37], increases the sensitivity of the economic value of equity to an increase in interest rates (Olech and Miszczak 2020, p. 8).

Although the results of stress tests carried out by the central bank (on the basis of data from June 2020) show that this sensitivity to changes in market factors is not significant, taking into account the historically recorded volatility (NBP 2020a), the banks themselves noticed this risk and applied hedging strategies[38]. The use of such strategies by banks is, inter alia, confirmed by the information disclosed by PKO BP S.A. on entering into IRS (Interest Rate Swap) hedging transactions[39] or information published by Bank Pekao S.A., on securing current accounts and protecting the interest income in the low interest rate environment, when buying fixed-rate bonds, using hedging strategies and derivative transactions – interest rate swaps (IRS)[40].

[36] According to the research carried out on behalf of PwC in 2020, for 40% of customers, the price is the most important factor when choosing banking products such as: mortgage, deposit or savings account. At the same time, one change in the bank's fee and commission tariff noticed by customers results that the percentage of customers declaring their willingness to change banks increases three-fold. Source: https://serwisy.gazetaprawna.pl/finanse-osobiste/artykuly/1494174,klienci-staja-sie-coraz-bardziej-wrazliwi-na-ceny.html (6.12.2021).

[37] https://pfrsa.pl/relacje-inwestorskie/obligacje-pfr.html (25.10.2021).

[38] It is about appropriate hedge accounting strategies. See: Rozdz. 7 Rozporządzenia Ministra Finansów z dnia 1 października 2010 r. w sprawie szczególnych zasad rachunkowości banków (Dz.U.2019.957 t.j.).

[39] Sprawozdanie finansowe PKO Banku Polskiego SA za rok zakończony 31 grudnia 2020 roku, www.pkobp.pl (25.10.2021).

[40] Jednostkowe Sprawozdanie Finansowe Banku Pekao S.A. za rok zakończony dnia 31 grudnia 2020,

As it results from the analysis based on selected banks, they recognised the interest rate risk of the banking book and applied mitigating strategies. In 2020, due to excessive liquidity of the whole banking sector, they actively adjusted their deposit interest rates to the changing market conditions[41]. However, they experienced a deterioration in their net interest income, which influenced their financial results. ROA declined at the end of 2020: –0.7 pp y/y, ROE: –6.4 pp y/y, while net interest income ratio (NIM): –0.4 pp y/y (KNF 2021).

Further challenges for banks' ALM models may result from the increases in NBP base rates initiated by the Monetary Policy Council (MPC) in October 2021[42]. The resulting increase in market rates, however, will most likely lead to an increase in deposit interest rates, encourage customers to transfer funds from current deposits to long-term deposits, and thus – increase the interest costs of current and short-term deposits. At present, it is too early to analyse the impact of a Council decisions.

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Perspectives for the Development of European Secured Notes

Abstract

The idea of creating a new capital market instrument emerged from the concept of Capital Markets Union. It draws inspiration primarily from the very good experience of covered bonds, which provide a stable, long-term and relatively cheap source of financing banking activities, while contributing to building the stability of the financial system. European Secured Notes fulfill the aims of the Capital Markets Union by supporting the financing of small and medium enterprises, which are the backbone of the EU economy, and which have been particularly hard hit by the COVID-19 crisis. The identification of the requirements for the development of ESNs, presented in this article, fits with the needs of the recovery of the post-pandemic European economy.

Key words: European Secured Notes, covered bonds, small and medium enterprises, financing economic recovery, ESG financing, Capital Markets Union

JEL codes: G18, G28

Perspektywy rozwoju europejskich obligacji zabezpieczonych

Streszczenie

Pomysł stworzenia nowego instrumentu rynku kapitałowego narodził się z idei unii rynków kapitałowych. Czerpie on inspirację przede wszystkim, z bardzo dobrego doświadczenia listów zastawnych, które zapewniają stabilne, długoterminowe i stosunkowo tanie źródło finansowania działalności bankowej, przyczyniając się jednocześnie do budowania stabilności systemu finansowego. Europejskie obligacje zabezpieczone realizują cele unii rynków kapitałowych wspierając finansowanie małych i średnich przedsiębiorstw, stanowiących trzon unijnej gospodarki a które zostały szczególnie dotknięte kryzysem wywołanym COVID-19.

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Identyfikacja przesłanek rozwoju ESNs, które zostały przedstawione zostały w niniejszym artykule, wpisuje się w potrzebę odbudowy post-pandemicznej gospodarki europejskiej.

Słowa kluczowe: europejskie obligacje zabezpieczone, listy zastawne, małe i średnie przedsiębiorstwa, finansowanie odbudowy gospodarki, zrównoważone finansowanie, unia rynków kapitałowych

Introduction

The idea of European Secured Notes (ESNs), which, similarly to covered bonds for mortgage loans, allow long-term source of financing banking activities in the small and medium enterprises (SME) lending segment, was born in the context of a debate of the Capital Markets Union (CMU)[1].

ESNs draw on the success of covered bonds, use best market practices for financing banking activities and address the needs of institutional investors. The idea of a new financial product is for it to remain available in stressful situations, work countercyclically and ensure the continuity of supply of sustainable private financing of the real economy, just like covered bonds, which exercise this role very well (Grossmann, Stöcker 2015, p. 110–111).

The idea of a new equity instrument has gained importance as a result of the EC initiative of the European Commission's new CMU Action Plan (*Capital markets union 2020 action plan...* 2020) and in view of the possibility of using ESNs to recover the post-crisis economy. The crisis caused by the COVID-19 pandemic, which has affected in particular the SME segment, which is the backbone of the European economy, requires comprehensive and coordinated actions.

The purpose of this Article is an attempt to identify the prospects for the development of European Secured Notes as a new instrument of the capital market and the role they can play in the recovery of the European economy following the crisis caused by the COVID-19 pandemic.

[1] The Capital Markets Union project aims to facilitate the inflow of investments from other countries and the movement and transfer of capital mainly to small and medium enterprises within the EU, among many, by the reinforcement of financing by capital markets compared to classical bank financing. European Parliament resolution of 9 July 2015 *on the creation of a capital markets union*, 2015/2634 (RSP) (*Capital Markets Union...* 2015).

1. EBA Recommendations

The EC requested the EBA to prepare recommendations on the ESNs standard, which were published in June 2018 (*EBA Report on European Secured Notes* (ESNS) 2018). These recommendations largely derive from the success of the harmonized European Covered Bond Framework (Directive (EU) 2019/2162).

1.1. Product standardization

According to the EBA recommendations, ESNs should be dual-recourse instruments so that investors have a primary claim to the credit portfolio constituting the cover pool and a direct claim to the bank issuing or guaranteeing ESNs, as is the case with the covered bonds.

The main differences between SME loans, on which ESNs are secured, and mortgage loans, on which the bonds are secured, are as follows (Vogel et al. 2020, p. 4):

- SME loans have higher claims ratios and are less homogeneous than mortgage loans;
- data on credit quality of SME loans are not standardized, which makes it difficult for lenders and investors to precisely determine and compare the quality of these loans;
- SME loans are usually unsecured, so lenders are usually unable to use LTV ratio to estimate the risk of these assets, as opposed to mortgage loans.

The EBA provided detailed recommendations on the ESNs product standard and how the model of the covered bonds should be adapted to the characteristics of SME loans in order to limit the risks identified above:

- each borrower under the cover pool should be an undertaking with an annual turnover not exceeding EUR 50 million[2];
- only registered EU credit institutions may issue ESNs[3];

[2] In view of the differences in the definition of SME between EU Member States, the EBA recommended adopting a common definition to harmonize the framework of SME ESNs and proposed using the definition in Article 501(2) *Capital Requirement Regulation* (CRR), which is widely used within EU institutions. In addition, the advantage of the CRR definition is that it covers a bigger number of SME loans than other definitions and its use would allow SME ESNs to qualify for preferential prudential treatment in the scope of use of capital (Regulation (EU) No 575/2013**).**

[3] This requirement aims to ensure that ESNs will be eligible for preferential treatment under the *Undertakings for the Collective Investment of Transferable Securities Directive* (UCITS), which allows for a freedom of operation of joint financing schemes within the EU under the authorization of a given Member State. Directive 2014/91/EU of the European Parliament and of the Council of 23 July 2014 *on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards depositary functions, remuneration policies and sanctions*, which amended Directive 2009/65/EC (*Undertakings for the collective investment in transferable securities, UCITS*).

- ESNs should be bankruptcy-remote instruments and investors should have dual recourse to the bank and to the cover pool[4];
- the cover pool should:
  - be separated[5] and unencumbered by claims of third parties;
  - include assets located in the European Economic Area (EEA)[6];
  - be exposed to a minimum of 500 borrowers;
  - have a minimum over-collateralisation of 130% of the capital plus interest[7];
  - be limited to regularly serviced SME loans and lease exposures within a single asset class[8];
  - be dynamically, periodically adjusted in accordance with the above criteria during the lifetime of the ESN[9];

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4 ESNs should have two important characteristics protecting them from bankruptcy, such as the covered bonds: (i) they should not be subject to automatic acceleration of debt repayment and investors should be provided with a preferential claim to the SME cover pool and (ii) the issuer should implement operational procedures in order to ensure a smooth transfer of responsibilities to the administrator in the event of insolvency.

5 Separation may be achieved by actual sale/pledge or use of the provisions of Directive 2002/47/EC of the European Parliament and of the Council of 6 June 2002 on financial collateral arrangements (*the Collateral Directive*). By comparison, the European Covered Bond Framework allows for segregation through (i) the cover register, which is a repository of all mortgage loans that are charged under a given cover pool (ii) transfer to a special purpose vehicle (SPV) through an actual sale or a contractual assignment, or (iii) segregation to a specialized credit institution (e.g. a specialized mortgage institution) at the time when the segregation is binding and required, including as a result of bankruptcy or restructuring of the issuer. Potentially one or more premises may be adopted for SME ESNs (Directive 2002/47/EC).

6 The assets of the cover pool should be limited to the EEA so that, in the event of non-compliance of the contract by the issuer, a liquidation of the coverage is legally enforceable. Although the EBA report does not specify this, it can be assumed that the location of assets and the registered office of the borrower should be located in the jurisdiction of the EEA. The European Framework of Covered Bonds includes an equivalence identification mechanism for certain jurisdictions that allow international emissions including the cover pool in which mortgages from outside the EU may occur. The question remains whether a similar mechanism will be applied in ESNs.

7 It is considered that SME ESNs need a higher over-collateralisation than traditional cover bonds, for which the benchmark is set at a minimum level of 105%. This is due to a higher risk of loss that may occur in the SME credit portfolio compared to the portfolio of mortgage. The EBA recommended a minimum requirement of 130% of over-collateralisation as it places itself between the observed over-collateralisation levels for covered bonds less exposed to risk (118%) and asset-backed securitisation (138%), which carries a greater risk.

8 The cover pool of SME ESNs should meet minimum conditions to ensure its high quality. In order not to unduly restrict the market, the recommendations are not excessively detailed in order not to exclude potentially high-quality loans. According to the EBA, the high level of over-collateralisation required for SME ESNs of 130% should cover all the risks that may materialize. In addition to the limited pool of assets, the EBA has set the following requirements: (i) appropriate risk diversification and a sufficiently high granularity of the cover pool should provide a minimum of 500 loans; (ii) the cover pool should be free from significant concentrations, e.g. aggregate exposure to one borrower should not exceed 2% of the total exposure value of the cover pool; (iii) in addition to the regular nature of SME loans, credit institutions should themselves have appropriate and well-defined standards of providing underwriting of issues.

9 A dynamic management of the cover pool addresses a potentially high risk of replenishment of assets that is specific to SME loans. It is highly likely that the cover pool of SME ESNs will have a short life,

- the issuer must establish a liquidity buffer[10].

The recommendations of the EBA place SME ESNs as instruments with defined quality parameters and form the basis for minimum harmonization, although the SME loan and lease exposures are naturally different in other sectors of the economy. Moreover, bankruptcy law and the related restructuring provisions also differ significantly between individual EU countries.

1.2. Infrastructure assets

Although the initial consideration was to stimulate infrastructure financing also through ESNs, the EBA ultimately presented a negative recommendation in this respect. Instead, it proposed to use infrastructure bonds with a single recourse backed by a static pool of assets. According to the EBA, a dual recourse instrument would not be appropriate in this case. An infrastructure loan-backed instrument is preferable because of the specific nature of assets and the heterogeneity of infrastructure loans, which are linked to specific assets with an individual flow generation profile (e.g. motorways or pipelines). These instruments have different risk profiles and grouping such different loans into a single cover pool under the same instrument would lead to a complex credit risk profile. Moreover, according to the EBA, a dual recourse instrument would not be appropriate for infrastructure projects which consume a relatively large amount of regulatory capital due to long term and high funding amounts and the requirement to create reserves. Standardization of infrastructure bonds in the EU will therefore require a new instrument, other than ESNs. The EBA proposed to create standardized EU infrastructure bonds for this purpose.

1.3. Supervision and reporting requirements

The following recommendations were presented in the scope of supervision and reporting of the ESN emissions of the EBA:

- each member state should designate a competent body:
  - allowing ESN emissions;
  - monitoring the compliance of ESN programs;
  - supervising, investigating and imposing sanctioning in the scope of ESN in accordance with the established regulatory framework;

as there is a high probability that the cover pool will be repaid before the maturity of the ESN. It can be expected that a dynamic management of the cover pool will allow for a removal of assets that will no longer meet the eligibility criteria also for other reasons (e.g. failure of the SME to comply with the credit agreement or their acquisition by other/large companies), as is currently the case for covered bonds.

[10] A liquidity buffer refers to cash and cash equivalents held in a separate manner that allows for additional coverage of the ESNs.

  - taking appropriate measures in the scope of restructuring and orderly winding up of the issuer, as in the case of the European Framework of Covered Bonds.
- if a competent supervisory authority of a Member State does not directly monitor the cover pool, it should be supervised by a dedicated entity independent of the credit institution and its financial auditor (differently from what is defined by the European Framework of Covered Bonds)[11];
- issuers should perform periodic stress tests of the cover pool to assess the impact of key risk parameters on the collateral and the ability of the ESN programme to process payments of issued instruments fully and in line with the schedule;
- as the cover pool is dynamic, issuers should provide initial and quarterly financial reports to investors, including, among many, information on the number of loans in the cover pool, the exposure value and the initial funding period of each credit, industries in which borrowers operate and the location of assets.

The presented recommendations on reporting are similar to the requirements of the European Framework of Covered Bonds and constitute a lighter version of the information standards compared to typical securitisation instruments (*Securitisation Framework*) (*European Commission Proposes...* 2020). The ESNs dual recourse mechanism ensures that more detailed information is not required. The implementation of the EBA recommendation would enhance the attractiveness of ESNs, they would be easier to administer and banks would not have to obtain permission from borrowers to share information or organize a cumbersome process for the collection of internal data.

1.4. Regulatory treatment

In view of a higher risk profile of SME ESNs, the EBA has assumed that they will have a higher risk weight than the covered bonds, which will affect their regulatory treatment. As regards capital requirements, as opposed to traditional cover bonds, SME ESNs should not enjoy preferential treatment due to the profile of the assets constituting their coverage. SME loans do not have standardized coverage, as in the case of mortgage loans. Differential treatment of risk weights is acceptable for SME ESNs on the assumption of certain conditions mitigating risk. If these conditions were met, ESNs would probably have higher risk weights than covered bonds but lower than unsecured bonds[12]. An investment in instruments that generate lower

[11] The framework of covered bonds was developing for more than two centuries, which has shaped market standards ensuring that the covered bonds are well monitored, without the need for additional supervision. In contrast to the covered bonds, ESNs have no history, on which such solutions may be built and therefore need to be monitored more closely during the initial period of their operation (e.g. Italian OBC have been subject to supervision by the Bank of Italy to ensure an adequate level of control and at the same time to allow for preferential regulatory and prudential treatment).

[12] According to the EBA recommendations, in order for SME ESNs to be eligible for differential treatment in terms of risk weights, they should meet the following criteria: (i) they should have a dual recourse feature and meet the structural and cover asset eligibility criteria to ensure sufficient credit

capital costs and have more liquidity than SME loans alone would lead to a reduction in the financing costs of the SME, just like covered bonds and securitisation allow a reduction in mortgage margins.

EBA recommended that SME ESNs should be eligible for preferential treatment under the UCITS Directive (Directive 2014/91/EU). UCITS establishes maximum investment levels for the investments of funds, acting in the EU on a single European passport, for individual classes of assets. In general, the exposure to bonds is limited to 5%, although UCITS may, under certain conditions, invest up to 25% of assets in eligible covered bonds[13]. EBA recommended that SME ESNs should also obtain more favourable investment limits for UCITS funds. Moreover, as secured claims, governed by dedicated legislation, especially if the recommended framework is approved by the European Parliament, SME ESNs would be exempted from the bail-in[14].

Although the EBA did not take a position whether the regulatory capital treatment of insurance companies investing in ESNs in the context of Solvency II should be changed, it sees the insurance investor base as particularly well suited to the financing of SME loans and suggests that the European Insurance and Occupational Pensions Authority (EIOPA) considered the possibility for insurance companies to give special treatment to these instruments The EBA noted that the proposed treatment of investments in ESNs by credit institutions according to the CRR, between covered bonds and direct emissions of credit institutions, should contribute to a reduction in the spread for risk reduction of insurance companies using the standard model under Solvency II.

enhancement and mitigate many of the risks of the underlying assets; (ii) they should respect the overall coherence of the CRR capital framework between exposures classes and in particular the capital treatment of SME ESNs should be based on the actual risk profile of the instrument and should not create unjustified level playing field issues at the expense of non-preferred covered bonds; (iii) they should be clearly separated from the covered bonds in order to correctly map the different risk profiles of the two classes of instruments and to avoid any market confusion or negative side effects on the covered bond market.

13 Article 52 of the UCITS Directive lays down minimum requirements for eligible bonds: (i) the issuer must be a credit institution registered in the EU and subject to special public prudential supervision; (ii) the law must determine which assets may be included in the cover pool; (iii) the cover pool must provide sufficient security to cover the claims of bondholders throughout the life of the bonds; (iv) the bondholders must have priority over claims to the cover pool in the event of bankruptcy of the issuer. Provided that the conditions are met, the UCITS funds may invest up to 25% of the assets in the bonds in question (like in covered bonds) instead of the standard 5%.

14 In accordance with Article 44(2)(b) of Directive 2014/59/EU (*the Bank Recovery and Resolution Directive*, BRRD), covered bonds compliant with UCITS are exempted from the bail-in. If SME ESNs are compatible with UCITS, such as traditional covered bonds, they should also fulfil the criteria necessary to be exempted them from the bail-in. Moreover, SME ESNs may be exempted from the bail-in pursuant to Article 44(2)(b) and in accordance with the preamble of BRRD 70 if they qualify as secured claims and the security covers 100% of the claim. Directive 2014/59/EU of the European Parliament and of the Council of 15 May 2014 *establishing a framework for the recovery and resolution of credit institutions and investment firms* and amending Council Directive 82/891/EEC, and Directives 2001/24/EC, 2002/47/EC, 2004/25/EC, 2005/56/EC, 2007/36/EC, 2011/35/EU, 2012/30/EU and 2013/36/EU, and Regulations (EU) No 1093/2010 and (EU) No 648/2012, of the European Parliament and of the Council Text with EEA relevance (*the Bank Recovery and Resolution Directive*, BRRD).

The EBA suggested that assuming a sufficiently high over-collateralisation, ESNs with a product standard similar to the covered bonds and additionally meeting the EMIR criteria (Commission Delegated Regulation (EU) 2016/2251) of the covered bonds, should be exempted from the requirement to establish initial and dynamic collateral margin, as is the case of covered bonds.

Provided that ESNs fulfil the requirements of eligible collateral for Eurosystem, they will be more resilient during a period of financial stress than securitisation instruments having static cover pools. The EBA recommended dynamic cover pools of ESNs with frequently performed stress tests, which would make them more attractive to investors.

2. Conditions for the development of the ESNs market

ESNs did not develop as initially expected. At the same time, new market solutions have emerged, such as the US loan guarantee scheme or the European EIF initiative, which could inspire the modification of this instrument.

2.1. Barriers to the development

Although ESNs are an interesting conceptual proposal, they have not yet gained sufficient market interest. It does not seem that possible further harmonization and cooperation of stakeholders would allow the market to be constructed in its current form. Financing of banking activities through ESNs would require their eligibility for repo transactions with central banks, which could pose a challenge in a situation of market stress. Current situation arising from the COVID-19 pandemic makes the requirements of IFRS 9 oblige banks to create provisions. The shift in credit assets to the next IFRS 9 classification ranges makes the deteriorating credit quality of commitment in the SME segment results in a deterioration of profitability of banks and weakens their capital. Significant pools of SME loans bring a risk of spiral in capital consumption and pose a challenge for their effective management. Risk transfer through, for example, securitisation will not be possible when these loans constitute a cover pool of ESNs.

When the idea of a new instrument for bank financing came into being, two alternative solutions were presented for ESNs:

- a financing instrument that maps the structure of covered bonds but based on a different asset class (depending on local regulations as a balance sheet or SPV instrument);
- static, amortised, dual recourse ABS SME, which is designed to relieve bank's capital.

The challenges faced in particular by smaller banks and weaker in terms of capital make financing SME assets a major challenge during market turbulence. On the other hand, support for SME is one of the pillars of the EU's CMU. The size and fluidity of the issues are key elements of success of traditional covered bonds. For this reason, the question arises of how to address all these challenges and create a new, secure and marketable EU financial instrument – ESNs?

2.2. American Credit Guarantee Programme

An interesting solution is the American Credit Guarantee Programme. The 7(a) Loan Program is run by the Small Business Administration (SBA), which is a U.S. government agency. A broad range of support for SME includes, among many, capital support, financing and consulting (*Small Business Administration...* 2021).

The loan guarantee program allows banks to provide financing to eligible SME, for which they pay a service fee and a guarantee fee. The criteria for support are not excessive. The amount does not exceed $5 million and the warranty period depends on its use. Depending on the amount of credit, the SBA guarantees between 75% and 85% of the bank's exposure, relieving its capital and providing adequate funding. Dedicated entities group loans guaranteed by the SBA from many banks and place them on the market in the form of bonds. These bonds have an unconditional guarantee of a government agency, which ensures the timeliness and full amount of payments, which means that they are treated in terms of risk on an equal footing with government bonds (*US Treasuries*). These bonds have a particular feature of the borrower's ability to prepay the financing. As they are often traded with a premium, investors, although they do not bear credit risk, bear the risk of prepayment. Nevertheless, the SBA's bonds are a desirable investment that banks can use in the process of liquidity management. The bank that granted the financing (*originating bank*) retains its residual capital participation, which enables underwriting and servicing.

2.3. European Investment Fund Initiative

The European Investment Fund (EIF) Initiative on SME financing has been launched in selected EU Member States[15]. The first guarantee instruments unlimited in amount were launched in Spain in 2015. As of August 2021, they also included SME

[15] The SME initiative is a joint financial instrument between the EC and the European Investment Bank Group (the European Investment Bank and the European Investment Fund), which aims to support the financing of the SME by providing partial coverage of the risk of the SME loan portfolio to funding institutions. In addition to the funds provided by Member States under the European Structural and Investment Funds (ESIF), the SME Initiative is co-financed by the EU from the project COSME and/or Horizon 2020 funds and by the EIB Group. Website of the European Investment Fund, SME Initiative, https://www.eif.org/what_we_do/guarantees/sme_initiative/index.htm (access 29.08.2021).

loans granted by banks operating in Bulgaria, Finland, Italy, Romania and Malta, and this initiative could be extended to further EU Member States. As part of the EIF initiative, banks identify SME loans granted as part of regular business that can receive 50% of risk coverage, after the guarantee fee has been paid. In this way, banks can free up capital, protect against loss and increase funding for SME. This initiative is managed by the EIF and the guarantee is provided by the EU and the European Investment Bank (the guarantor for the program implemented in Spain is the Kingdom of Spain) (*New Issue Rating Report* 2017).

The EIF initiative has some common features with covered bonds. It sets out eligibility criteria for loans and the retained capital participation of the financing bank and the mechanism for the sharing of loss with the guarantor ensure mutual interest and prevent the moral hazard of banks providing financing of the SME. As part of this initiative, an effective and standardized contract model has been drawn up and the eligibility criteria for SME loans include: credit quality, financing period, portfolio concentration and uniform definitions of concepts. Issues relating to state aid have also been addressed. The EIF, as an entity managing the initiative, retains effective supervision over the policies and procedures of the financing banks. It also provides a unified credit assessment of the reference cover pools of the contributing banks in order to maintain high quality of credit portfolios.

The EIF initiative, implemented in several countries, has mostly developed in Spain, but there has been a limited period of supplementation and is currently in a depreciation phase.

2.4. ESNs 2.0

In order for the next part of the European secured notes not to become a one-off project again, as is the case of its current version, it should address the following expectations (Fuchs, Bergman 2020, p. 4):

- clear and transparent guarantee structure similar to the EIB initiative, allowing for preferential risk weights and obtaining the highest rating;
- local regulations based on the EU Directive, which should ensure a high level of standardization and harmonization of security, a clear transfer mechanism and the division of roles and responsibilities;
- national pool structures supporting diversification of collaterals, allowing regular primary issues and ensuring high liquidity of the secondary market;
- flexible framework providing for the replenishment of the cover pool and the issuance of bullet bonds[16];
- preferential financing of eligible SME loans as an integral part of the CMU;

[16] The short-term and refinancing nature of the typical SME loans means that amortising bonds would be too low in issue volume from the point of view and according to the expectations of investors to keep a high level of LCR (early repayment would reduce the spreads).

- strong and sustainable commonality of interests of banks constituting the cover pool through the application of a dynamic guarantee premium[17];
- independent monitoring of required standards and transparency of emissions for investors.

ESFS 2.0, based on the European guarantee structure and addressing the above expectations, offers an opportunity to create an effective platform for financing SME in the EU. The establishment of a common European funding platform to pool the SME loans, while retaining the participation of risk finance banks (*skin in the game*), holding security in the form of EU guarantee, would provide a good basis for building a new class of assets with high-credit quality.

Regular and high emissions (*jumbo*) would allow the construction of an effective secondary market that would support the use of ESNs as high-quality liquid security that could be used by banks to manage the LCR requirements. The eligibility for the repo transaction with the central bank would increase the market acceptance of ESNs. Moreover, using securitisation techniques to transfer residual risks of EU-guaranteed instruments would allow investors to access the EU SME credit market as a whole or at least a very well-diversified SME risk of a given country.

In the investor environment, there is a growing support for portfolio allocation policy, which would allocate a certain pool of assets to management, for projects pursuing specific environmental, social and governance (ESG) objectives. This increases the growth potential of a new instrument. SME ESNs could, for example, provide exposure to a segment of the European economy, which traditionally has no easy access to finance, by obtaining a brand of social bonds. Like the development of an energy-efficient covered bonds market, SME ESNs could be grouped for economically disadvantaged areas or for socially-oriented borrowers to encourage investors who not only pay attention to the rate of return on investment but also to the ESG profile (*double bottom line approach*) of investment instruments. Taking into account the EC's actions toward a new green taxonomy[18], depending on the issue guarantee policy of the issuing bank, SME ESNs may become another sustainable financing instrument that would allow private capital to be included in the implementation of objectives of the ESG (*Financing a Sustainable European Economy* 2018). Complementing the eligibility criteria of the SME loans with ESG elements would allow these instruments to be covered by the European Green Deal label[19], providing them with additional support.

[17] In order to eliminate moral hazard, the premium should measure the risk of the contributing bank instead of having a predetermined level. Retaining a risk on the part of the issuer would help to ensure high emission standards and efficiency of emissions.

[18] The EU taxonomy is a system of a uniform classification of actions for sustainable economic development, which were defined by the regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 *on the establishment of a framework to facilitate sustainable investment*, and amending Regulation (EU) 2019/2088 (Text with EEA relevance) (Kwiatkowska 2020).

[19] The European Green Deal is an action plan for a sustainable EU economy that it wants to achieve by transforming climate and environmental challenges into new opportunities in all policy areas, and by ensuring the transition to be fair and inclusive. Climate change and environmental degradation

Summary

The recovery of the post-pandemic European economy and in particular the SME segment, requires the creation of a new financing instrument and the stimulation of the development of the European capital market within the framework of the CMU project. SME ESNs should be formatted by creating a common, transparent framework at the level of the entire EU.

One of the achievements of the European Framework of Covered Bonds was a construction of a wide European market for which minimum requirements were agreed, contributing to an increased investor involvement. A catalogue of technical, regulatory requirements and product standards may also be created for ESNs. This way, these instruments could become another tool for a stable, long-term financing of banks, reducing the costs of financing SME, while contributing to the recovery of the post-pandemic European economy and to the increase of stability of the financial system.

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pose a threat to Europe and the rest of the world. To meet these challenges, the EU has announced the objectives of a new growth strategy to transform the Union into a modern, resource-efficient and competitive economy that will achieve a net zero greenhouse gas emissions in 2050, decoupling economic growth from resource use and in which no person or region will be "lagging behind". This initiative is also intended to support the exit from the COVID-19 pandemic. Financing of this project amounts to EUR 600 billion from the NextGenerationEU reconstruction plan and the 7-year budget of the EU. Website of the European Commission, European Green Deal, https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_pl (access: 29.08.2021).

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Miscellanea

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Macroeconomic challenges and forecasts for Poland in the opinion of European financial congress experts – 8th edition

Introduction

The forecasts and opinions presented hereafter represent a quantitative and qualitative consensus from the responses to our questions received by 6 December 2021 from prominent Polish economists.

Quantitative forecasts were sent by 15 experts, and 42 experts presented their opinions concerning:

- the greatest threats to the economic situation,
- the greatest threats to the stability of the financial system,
- recommended actions in the area of economic policy.

Additionally, in this edition of the Report, we asked about the most important threats to the credibility of the Polish zloty in the perspective of 2023.

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Forecast

The dawn of 2021 took place in a situation with little optimism for the public health of Poles and considerable concern about the economic prospects of many households and businesses. The third wave of the pandemic in Poland at the end of last year was one of the most dangerous in the world. The same is unfortunately the case with the current, fourth wave. It has become clear that COVID-19 has become a long-term problem and risk, despite the availability of vaccines. As we warned in the previous Report and considering what is happening now, the introduction of additional measures to limit the spread of the pandemic may be repeated and affect the economic situation of many entrepreneurs. Nevertheless, the Polish economy recovered strongly in the first three quarters of 2021. Real GDP reached pre-crisis levels as early as Q2 of 2021. Although supply disruptions for some commodities and sharp increases in their prices have created problems for many industries, the strong labour market and consumer spending capacity (including a reduction in involuntary COVID savings) made the economic results satisfactory, although the effect of the very low baseline of 2020 should be borne in mind when interpreting the annual dynamics.

The economic situation in the coming quarters and years will be influenced not only by a tighter monetary policy, which has to fight high inflation, a weak zloty and rising inflation expectations, but also by an expected, at least slight, tightening in fiscal policy. All of this, within the perspective of the coming year, will be superimposed by the implementation of the Polish Deal (PL) and the implementation, after its possible approval by the European Commission (EC), of the delayed National Recovery Plan (NRP), the final shape of which has yet to fully emerge, although strong pressure from the EC concerning the implementation of reforms and spending on climate-energy and digital transformation should be expected.

We already know the preliminary GDP estimate for the third quarter of this year. and the monthly basic macroeconomic data for the end of November. This is the starting point of the macroeconomic forecast prepared by the EFC experts.

According to the current forecasts of experts cooperating with the EFC, after a recession with a contraction of 2.5 percent last year, a strong economic rebound should be expected in 2021 with GDP dynamics at a level of 5.2%, and then decreasing to 4.4% in 2022 and to 4.0% in 2023. GDP projections indicate that experts expect a faster and larger, but much shorter rebound after 2020 than was seen in previous forecast editions. The average forecast of economic growth for 2022 decreased by 0.7 percentage points, and in 2023 by 0.4 percentage points. This decreasing optimism can be linked to higher inflation and the expected monetary policy response, as well as problems with the acceptance of Poland's National Recovery Plan (NRP), which provides for access to over EUR 58 billion (almost PLN 270 billion, over 12% of Poland's GDP). Domestic demand is set to grow faster than GDP (6.6%, 4.5% and 4.4% respectively in the years 2021–23), and it will also be the main growth factor. Experts see an increase in investment this

year (an increase of 6.7%) they are more optimistic than they were previously, but also much more optimistic about the coming years – investment is forecast to grow at a rate of about 6.5–6.7%. This is largely the result of the observed confusion with the NRP: even if the inflow of EU funds under the Facility for Reconstruction and Resilience, which is the main element of the Next Generation EU, does occur, it will be delayed *(in fact* it is already delayed). The increase in individual consumption this year will amount to as much as 5.8%, and 4.5% (in 2022) and 3.8% (in 2023). A strong growth in domestic demand, including the demand for imported goods, an increase in the prices of some imported goods and raw materials, as well as an increase in labour costs and the related decline in the competitiveness of the Polish economy has already caused and will cause in the future, a change in the current account of the balance of payments: already in 2021 a deficit of –0.3%. GDP will be recorded, which in the following years will grow to –0.7% of GDP in 2022 and –0.9% of GDP in 2023. This is a significant change in forecasts: previously the current account surplus of the balance of payments was forecast to decline gradually, now we have an increasing deficit.

The inflation expectations of the EFC experts have increased again. According to them, the projected inflation will be higher than it was in earlier forecasts during the survey period and will not return, not only to the vicinity of the inflation target, but even to the permissible band of deviations from the inflation target (the band of 1.5–3.5%) in the last year of the survey. Average inflation is estimated at 5.1% this year, it will be as much as 6.3% in 2022 and 4.4% in 2023. This is a significantly higher (even by 3 percentage points) level than in the government's forecasts: 4.3% in 2021,3.3% next year and 3.0% in 2023, constituting the basis for the preparation of the state budget for 2022. The zloty's exchange rate against the euro is expected to remain relatively stable throughout the forecast period, but at a level 3–5% higher (weaker zloty) than in the previous edition of the forecast survey. Currently, it is at a level of approx. PLN 4.6/EUR and approx. PLN 4.0/USD. Another significant change, reflecting the change in the NBP's inflation narrative, are the forecasts of interest rates and bond yields. Interest rates are set to rise above 3% in 2023, and the yield on 5-year bonds will be 3.4% in 2023 (2.8% in 2021 and 3.4% in 2022). These values are twice as high as those reported in June this year. It is worth noting that EFC experts predicted an interest rate hike by the MPC, which took place on 8 December this year (i.e. after the quantitative forecasts were submitted for this study).

The situation of the labour market in Poland is set to remain relatively stable. As for unemployment, while there is not much room for a decline in the unemployment rate, it should remain at around 3%. Similarly, for employment,, it is set to increase slightly by 0.5–1.0 percent during the forecast period, therefore the available supply of skilled workers will be limited. As a result of such a situation on the labour market, the upward pressure on wages will be visible in the forecasts. This year, salaries are set to increase by 8.4%, a similar trend will occur in 2022 (8.5%) and a little less in 2023 (6.8%). The slightly higher (nominal) wage growth forecasts are consistent with the higher inflation forecast.

Higher inflation in 2021 resulted in a better nominal execution of budget revenues in the current year, with planned expenditure in the budget based on the government's inflation forecast for the current year at 1.8%. At the same time, economic growth is slightly higher than forecasted at the stage of preparing the budget for 2021 (its structure is also favourable for the Minister of Finance). As a result, the situation of the public finances is better than expected in the first half of the year. This is reflected in the deficit estimate for 2021. Currently, it is projected at only 3.5% of GDP (and public debt at 56.3% of GDP). In the coming years, the forecasts are also slightly more favourable, although the deficit is expected to remain above 3% in both 2022 and 2023, and public debt will remain above 55% of GDP until at least 2023.

Banking experts predict a recovery in the area of loans to individuals and enterprises in the next two years.

The fastest real growth in the volume of debt is expected in the area of housing loans to households. This may be related to lowering the requirements of own contributions and escaping inflation. In a period of rapid increases in prices on the real estate market, this additionally stimulates the demand for apartments and may have an effect opposite to the one intended. In other words, this type of state interventionism will result in public money (BGK guarantees) to 'guarantee' buyers higher housing prices.

On the other hand, the projected increase in the volume of corporate loans after the crisis-induced slump in this market is optimistic.

Figure 1. Forecasts of selected macroeconomic indicators in 2020–2023

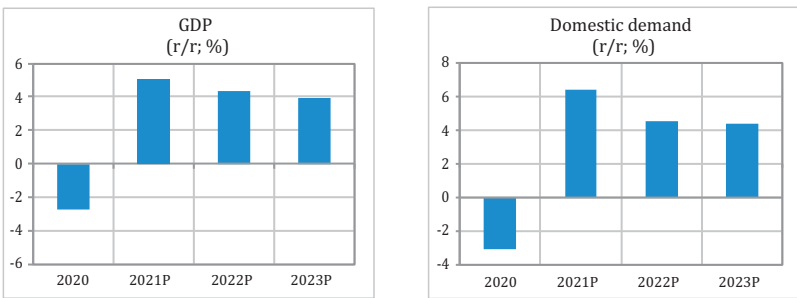
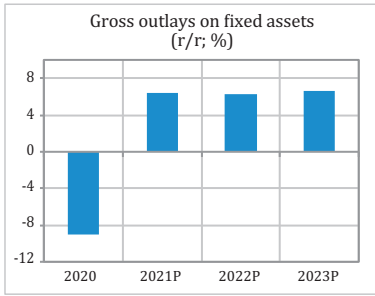
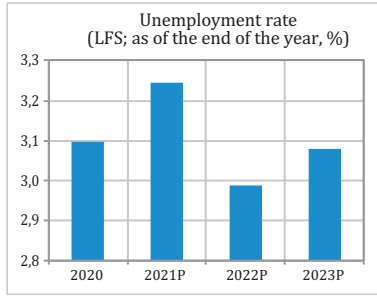
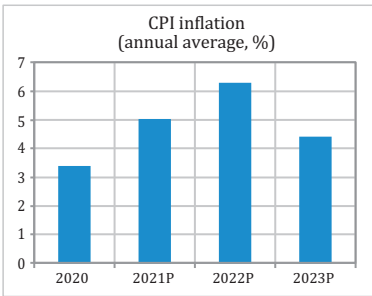
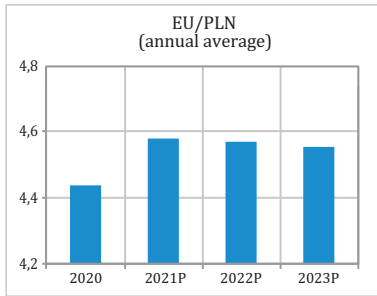


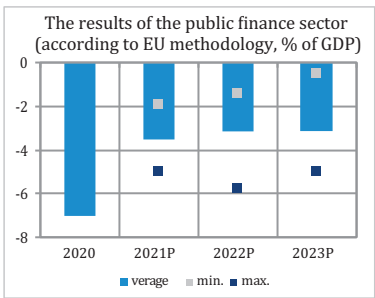
Figure 1 – continued

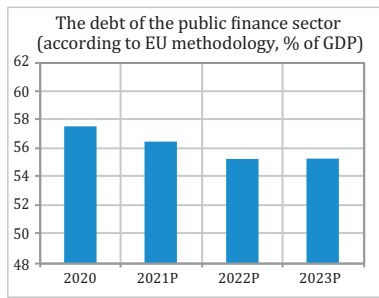


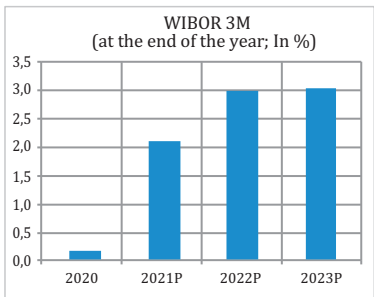


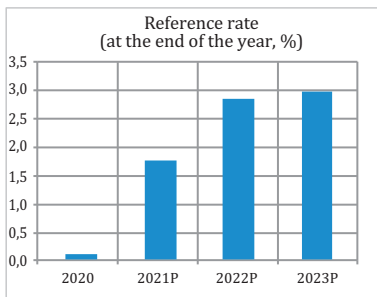












Indicator	Measure	2020	Survey results			Number of experts
			2021P	2022P	2023P	
GDP (y/y; %)	average	-2.5	**5.2**	**4.4**	**4.0**	[15]
	deviation		0.3	0.4	0.8	
Domestic demand (y/y; %)	average	-3.4	**6.6**	**4.5**	**4.4**	[13]
	deviation		1.0	1.0	0.6	
Individual consumption (y/y; %)	average	-3.0	**5.8**	**4.5**	**3.8**	[15]
	deviation		0.6	0.7	0.6	
Gross outlays on fixed assets (y/y; %)	average	-9.0	**6.7**	**6.5**	**6.7**	[14]
	deviation		1.4	2.5	2.1	
Unemployment rate (LFS, at the end of the year, %)	average	3.1	**3.3**	**3.0**	**3.1**	[12]
	deviation		0.2	0.3	0.5	
Remuneration in the national economy** (y/y; %)	average	6.6	**8.4**	**8.5**	**6.8**	[13]
	deviation		0.5	0.9	1.9	
People working in the national economy** (as at the end of the period, y/y,%)	average	-0.6	**0.7**	**1.0**	**0.5**	[11]
	deviation		0.3	0.6	0.5	
Inflation rate (CPI inflation annual average, %)	average	3.4	**5.1**	**6.3**	**4.4**	[14]
	deviation		0.1	0.3	0.7	
Inflation rate (CPI, XII, %)	average	2.4	**8.0**	**4.8**	**3.8**	[14]
	deviation		0.3	0.6	1.1	
EUR/PLN (annual average)	average	4.4	**4.6**	**4.6**	**4.6**	[12]
	deviation		0.0	0.1	0.3	
EUR/PLN (end of the year)	average	4.6	**4.6**	**4.5**	**4.5**	[14]
	deviation		0.0	0.2	0.3	
USD/PLN (annual average)	average	3.9	**3.9**	**4.0**	**4.0**	[12]
	deviation		0.1	0.1	0.2	
USD/PLN (end of the year)	average	3.8	**4.1**	**4.0**	**3.9**	[14]
	deviation		0.1	0.1	0.2	

Indicator	Measure	2020	Survey results 2021P	2022P	2023P	Number of experts
Reference rate (end of the year; %)	average	0.1	**1.8**	**2.9**	**3.0**	[15]
	deviation		0.2	0.6	0.8	
WIBOR 3M (end of the year; %)	average	0.2	**2.1**	**3.0**	**3.1**	[12]
	deviation		0.2	0.6	0.7	
Yield on 5Y bonds (annual average; %)	average	0.4	**2.8**	**3.4**	**3.4**	[10]
	deviation		0.9	0.6	0.8	
Public finance sector balance EU methodology (% of GDP)	average	-7.0	**-3.5**	**-3.1**	**-3.2**	[13]
	deviation		0.8	1.1	1.2	
Public finance sector debt EU methodology (% of GDP)	average	57.5	**56.3**	**55.2**	**55.3**	[12]
	deviation		1.4	2.9	4.6	
Balance of payments current account (% of GDP)	average	3.6	**-0.3**	**-0.7**	**-0.7**	[13]
	deviation		1.2	1.0	1.3	

Wskaźnik	Miara	2019	2020	Wyniki ankiet 2021P	2022P	2023P	Liczba eksper-tów
Debt volume on consumer loans to households (y/y; %)	average	8.4	-2.1	3.7	7.2	7.6	[5]
	deviation			1.7	1.6	0.7	
Debt volume on home loans to households (y/y; %)	average	6.6	7.6	8.2	7.4	5.8	[5]
	deviation			2.2	1.7	2.1	
Debt volume in the non-financial corporate sector (y/y; %)	average	3.0	-4.8	2.2	8.4	6.9	[5]
	deviation			2.4	2.4	1.2	
Household deposits (y/y; %)	average	9.7	10.7	6.0	6.5	7.0	[5]
	deviation			1.0	0.8	1.2	
Deposits from non-financial corporations (y/y; %)	average	10.0	19.0	11.4	4.5	4.6	[5]
	deviation			2.0	0.6	2.3	

The biggest threats to the economic development of Poland

As in the previous editions of 'Macroeconomic challenges and forecasts for Poland', we have created a map of the most important threats to the economic situation in Poland from the perspective of 2023. Regardless of the quantitative macroeconomic forecasts, experts cooperating with the EFC have identified the greatest potential threats to economic development. In this edition of the study, the threats were assessed in two stages: in the first stage, each of the experts was to present the three most important, in their opinion, threats to the economic situation. Based on the answers presented at this stage, it was possible to compile a list of the 7 most important threats that most often appear in the opinion of the experts. These are:

1. High and persistent inflation.
2. Uncertainty related to the development of the pandemic.
3. Rising interest rates.
4. Global problems with the availability of raw materials, materials and delays in deliveries.
5. Conflict with the EU.
6. Rising energy prices.
7. Shortages in the labour market and the wage and price spiral.

In the second stage, this list was used to assign by each of the experts a subjective assessment of the importance and probability of the occurrence of individual threats. The synthetic weight (significance) of individual threats was created as the sum of points assigned by experts to individual threats, with each expert having a total of 100 points at his/her disposal. In addition, each expert assessed the subjective probability of individual hazards and the synthetic assessment of the probability of the occurrence of a hazard is the arithmetic mean of the subjective probabilities. Below, we also present a compliance assessment of the indications of the experts as a percentage of the total number of experts who indicated a specific threat. Graphically, the results of the experts' opinions are presented in the figure on page 8 – 'The biggest threats to the economic development of Poland within the perspective of 2023', where the size of the circles illustrating individual threats is the sum of the products of the severity and probability of a given threat. They can be treated as the significance of the risk of the occurrence of this hazard.

In the current edition of the study concerning macroeconomic challenges and forecasts for Poland, four threats have gained a decisive advantage when it comes to the importance of a threat indicated by experts on average and the probability of its occurrence.

The threat that indicated a high degree of importance and a high probability of occurrence concerns the recurrence of infections, virus mutations and lockdowns, and the related uncertainties. According to EFC experts, this threat is still significant, and the probability of its occurrence turns out to be higher than six months ago in the June edition of the survey (7th edition), although it was also relatively high at

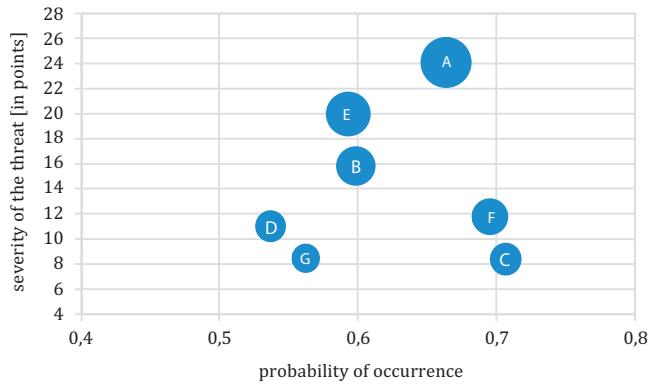
that point in time. The experiences of the last days and weeks, all over Europe, but especially in Poland, confirm the fears of the EFC experts, and the availability of the vaccine has not changed the perception of this threat all that much, which is significant.

Similarly, the concerns of the June edition of the survey are confirmed in terms of inflation. Six months ago, high and persistent inflation was identified as the third most important threat in the medium term. Unconvincing to EFC experts, the monetary authorities' narrative of temporarily higher inflation which is being observed at present, has in the meantime changed by 180° and the MPC has already raised interest rates three times. However, this still does not reassure economists: high, persistent inflation is currently identified as the most important threat to the economic situation, more important than the COVID-19 pandemic. High inflation, through redistributive effects, hits the poorest part of society, fuels the wage-price spiral, raises the inflation expectations of businesses, which in turn increases the cost of fighting inflation when trying to bring it down, inhibits investment, and is a hidden tax on savings. As may be seen in quantitative forecasts, EFC experts estimate that, on average, it will be significantly higher next year than this year.

The second most important threat to the economy, and therefore more important than the fourth wave of the pandemic and its consequences for the economy, that stands out in the current survey is the conflict with the EU. Billions of euros meant to help us to recover from the pandemic, reform the domestic energy sector, speed up digitalisation and support business, may be at risk because of the Poland-EU conflict that has been developing for months. The EU has a mechanism called money for the rule of law, under which the Union can suspend, reduce or restrict access to EU funds in proportion to the scale of the violations.

The fourth threat is rising energy prices, which are partly responsible for the high inflation that worries economists most, but are in themselves a potentially huge economic problem and challenge. Despite the recent boom in photovoltaic power plants, the Polish economy remains heavily dependent on coal and this is becoming a growing burden. The end of coal is inevitable for a number of reasons, including: the rising costs of its acquisition and use, the risks associated with dependence on imported (mainly from Russia) raw material (although the situation has temporarily reversed due to a sharp increase in the price of fossil fuels), difficulties in financing and maintaining production infrastructure, the negative impact on the climate and the rising cost of CO_2 emissions, the environmental risks associated with coal mining, the declining public acceptance of burning coal both in the energy sector and in heating. For these reasons energy prices in Poland will increase and will constitute a burden for the maintenance of the competitiveness of the Polish economy. That is why it is so important for experts to resolve the conflict with the EU, which would allow for the transfer of EU funds for energy sector and climate transformation.

Figure 2. The most important threats to the economic situation in Poland



* The size of the circles indicates the sum of the products of the weight of the factor and the probability of occurrence assigned by individual experts.

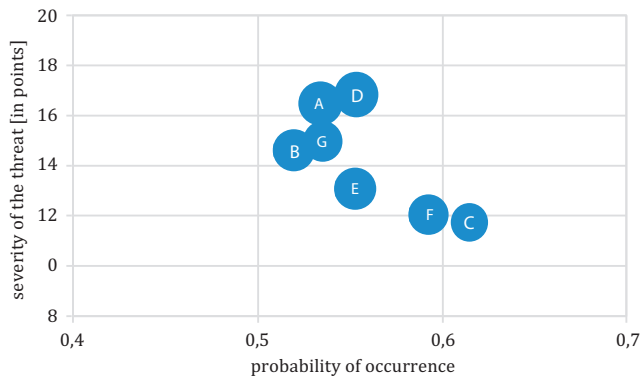
		Weight (1 indicates the highest weight)	Probability	Percentage of respondents
A	High and persistent inflation	1	0,66	100%
B	Uncertainty related to the development of the pandemic	3	0,60	98%
C	Rising interest rates	6	0,71	79%
D	Global problems concerning the availability of raw materials, materials and delays in deliveries	5	0,54	93%
E	Conflict with the EU	2	0,59	100%
F	Rising energy prices	4	0,69	93%
G	Shortages in the labour market and the wage and price spiral	7	0,56	86%

The biggest threats to the stability of the Polish financial system within the perspective of 2023 in the opinion of experts of the European Financial Congress

As in the two previous editions of the EFC forecasting consensus, the vast majority of experts (41 out of 42) believe that the most important threat to the stability of the Polish financial system in the coming years will be a deterioration in the value and quality of the loan portfolio. The post-crisis loss of value of the loan portfolio resulting from a deterioration in the financial situation of borrowers will be strengthened by increases in interest rates and a weakening of the exchange rate. Unfortunately, the vast majority of experts (also 41 out of 42) expect an accumulation of credit and legal risk resulting from the failure to resolve the issue of foreign currency housing loans and from the growing number of loan agreements with 'franc borrowers' being cancelled by courts. An additional element that may destabilise the Polish financial system is the risk related to climate change and the need to adapt in the process of the green transformation. A threat to the stability of the financial system in the long term is the excessive share of the State Treasury in the ownership of banks.

The above-mentioned threats mean that the rate of return on equity (ROE) and the market value of banks have been decreasing for several years, and the tax burden has increased. The decline in the investment attractiveness of banks means that in a crisis situation and the need to recapitalise them, the only source of capital will be taxpayers.

Figure 3. The biggest threats to the stability of the Polish financial system within the perspective of 2023



* The size of the circles indicates the sum of the products of the weight of the factor and the probability of occurrence assigned by individual experts.

Figure 3 – continued

		Weight (1 indicates the highest weight)	Probability	Percentage of respondents
A	Foreign currency housing loans	2	0,53	98%
B	The weakening of the zloty	4	0,52	86%
C	Excessive share of the State Treasury in the ownership of banks	7	0,61	83%
D	Deterioration of the value and quality of the loan portfolio as a result of the weakening of the exchange rate and interest rate increases	1	0,55	98%
E	No countercyclical macroprudential policy	5	0,55	93%
F	Risks related to climate change and the need to adapt in the process of the green transformation	6	0,59	88%
G	Deterioration of the financial situation of borrowers	3	0,53	93%

The most important threats to the credibility of the zloty within the perspective of 2023

Currently, the Polish zloty, like the US dollar or the euro, may be termed a fiat currency, i.e. money not based on ore, but functioning only on the basis of trust in the currency issuer. As it is only based on trust in the state, which in turn depends on many factors, the credibility of the zloty is also the result of many factors. Due to the strong depreciation of the Polish currency which was observed in November this year, we asked a group of prominent Polish economists for their opinion on what currently determines the credibility of the PLN. Based on the opinions of 42 experts, mainly banking macroeconomists and academic professors, we distinguished eight homogeneous groups of factors:

1. **No credible monetary policy.** Currently, monetary policy is conducted contrary to the mandate of the central bank. The decisions which led to the most negative interest rates in our region are particularly questionable. Moreover, the independence of the NBP from the current economic policy is being questioned. The late start of monetary policy normalisation is also controversial.
2. Chaotic, illegible and **inconsistent information policy of the NBP** and the rhetoric of lowering expectations for interest rate hikes.
3. **Uncontrolled and persistent** inflation and underestimating the downward pressure on the zloty by the NBP and the MPC, a one-sided (and mainly doctrinal) approach to the instruments for fighting inflation.
4. **Escalation of Poland's** conflicts with the EU, and, consequently, a reduction in funds for Poland (crawling Polexit), including a delay in the approval of the National Reconstruction Plan.

5. **The condition of public** finances, including the growing current account deficit and the temptations of excessive state indebtedness in the pre-election period combined with high and accelerating wage growth.
6. **A Growing** external threat, rising international political tensions and global risk aversion as a result of geopolitical tensions, including: increased border tensions, the escalation of tensions in currency markets, new shocks in the energy market, problems with high inflation and balance of payments issues with other countries of the region, as well as the faster normalization of monetary policy in the U.S. and a change in the perception of the Central European region by investors, deterioration in the competitiveness of the Polish economy as a result of restrictions to CO_2 emissions.
7. **A Growing** internal threat resulting from political instability in Poland and the unreliability of government decision-makers, excessive state participation in the banking sector, loss of investment attractiveness due to non-compliance with international law and discrimination against investors from outside the EU, lack of NRP funds combined with the loss of Poland's creditworthiness, a lack of reliable estimates concerning the impact of Polish Governance and budget projections.
8. **A Growing** legal risk in the banking sector related mainly to the lack of a clear solution to the issue of foreign currency loans for housing and a possible ruling of the Supreme Court, resulting in a significant scale of cancelled loan agreements.

In the next stage, we asked experts to rank particular groups of factors and the subjective probability of their occurrence. The synthetic results of the research are presented in the figure and table below.

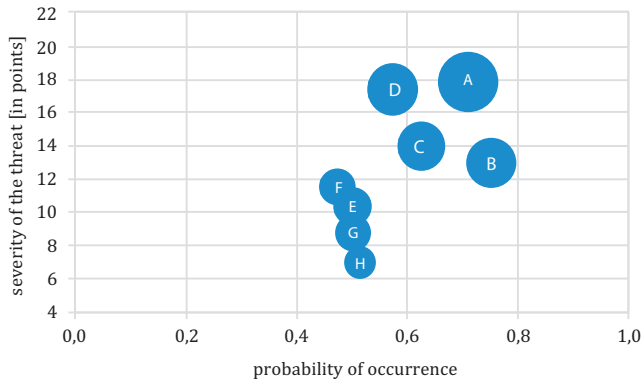
The monetary policy of the NBP is the greatest threat to the credibility of the PLN. It is conducted contrary to the mandate of the central bank, i.e. maintaining price stability. The decisions which led to the lowest interest rates in the region and the delayed start of monetary policy normalisation are assessed particularly critically. Additionally, there are issues related to the illegible and inconsistent information policy of the NBP. In the opinion of experts, the strength of the impact of this threat and the probability of its occurrence pose the highest risk. Moreover, the issue of the insufficient independence of the NBP from the current economic policy is raised. These threats are also the main causes of uncontrolled and persistent inflation, as well as rising inflation expectations.

Trust in the state, and therefore the credibility of the PLN, is being destroyed by the escalation of Poland's conflicts with the EU. The consequences of a 'crawling Polexit' may be a reduction in funds for Poland, including a delay in the approval of the National Reconstruction Plan.

To sum up, the lack of a credible monetary policy, the escalation of Poland's conflict with the EU, and uncontrolled and persistent inflation are the three most important threats to the credibility of the PLN now and in the near future. According to experts, their significance and the probability of their occurrence are higher than the external threats resulting mainly from tensions in international politics and

shocks in the energy market. An important factor undermining confidence in the zloty is also the condition of the public finances, the temptation to take on excessive state debt before the elections and the growing current account deficit. In general, in an assessment of threats to the credibility of the PLN, experts are exceptionally unanimous, and the dispersion of their opinions is relatively small.

Figure 4. The most important threats to the credibility of the zloty within the perspective of 2023



* The size of the circles means the sum of the products of the weight of the factor and the probability of occurrence assigned by individual experts.

		Weight (1 indicates the highest weight)	Probability	Percentage of respondents
A	No credible monetary policy	1	0,71	93%
B	Inconsistent information policy of the NBP	4	0,75	93%
C	Uncontrolled and persistent inflation	3	0,62	88%
D	Escalation of Poland's conflicts with the EU	2	0,57	98%
E	State of public finances	6	0,50	93%
F	Growing external threat	5	0,47	95%
G	Growing internal threat	7	0,50	88%
H	Growing legal risk	8	0,52	76%

Recommendations of the macroeconomists of the European Financial Congress

The three most important recommended areas of action in Polish economic policy until 2023

1. Controlling the inflation growth and creating conditions to protect society's savings against the loss of their real value

According to EFC experts, it is necessary to control inflation growth as soon as possible, it has clearly gone beyond the control of NBP monetary policy. The following is recommended:

- urgent restoration of trust (credibility) in the NBP and the Monetary Policy Council (MPC): the chaotic narrative of the domestic monetary authorities regarding inflation has notably reduced the possibility of influencing the inflation expectations of both businesses and consumers,
- clear and predictable monetary policy (departure from the surprise policy of the NBP), development of a medium-term monetary policy normalisation plan,
- making interest rates more realistic and halting the erosion of the value of cash savings of households,
- appointment for a fifth term of the MPC of persons distinguished by their knowledge of economics and finance, independence and aversion to high inflation, making the decisions of the NBP and the Monetary Policy Council independent of current politics,
- making significant improvements in the communication of the NBP and the MPC with the financial market and society, improvement in the consistency of the NBP information policy in the field of monetary and exchange rate policy.

2. Urgent end of the conflict with the EU in legal matters, triggering the release of funds for economic recovery after the pandemic and for the energy sector and climate transformation

Many activities recommended by EFC economists concern the strategy of economic reconstruction and the modernisation of the energy system. Investments that can be financed with EU funds are important for at least three reasons: they are important from the point of view of maintaining or increasing the economic potential of the Polish economy, they are a way to protect against the rising price of CO2 emission allowances and the effects of this increase on energy prices, they are a very good way of using EU funds, which is due in part to the linking of these funds with the requirements of necessary reforms to achieve climate and energy goals. In particular, the following is recommended:

- restoring the foundations of a democratic state of law, including respect for the rule of law,

- restoring confidence in the judicial system free from political influence, which will help to improve the climate for future private investments (still very low in Poland at present),
- quick agreement concerning the final shape of the National Reconstruction Plan with the European Commission and the elimination of the risk of restricting access to other EU funds,
- closing other (remaining) sources of conflict with the European Commission and other EU institutions,
- striving to improve the image of Poland in the international arena, which will help to improve the investment climate and reduce the pressure to weaken the zloty exchange rate,
- accelerating the transformation towards a low-carbon economy.

3. Normalisation of fiscal policy, improvement of the condition and transparency of public finances

Despite the fact that the budget situation in 2021, due to higher than assumed inflation, is better than forecasted in the previous edition of the Report, many EFC experts devoted their recommendations to the tax and budget policy. They suggest, first of all:

- the preparation of a credible medium-term fiscal stabilisation plan,
- sealing, reform of transparency and parliamentary control of public finances,
- changing the structure of budgetary expenditure into a more developmental one, reducing the growth rate of social expenditure, which has been excessively high in recent years,
- postponing the implementation of the so-called 'Polish Deal' so that there is time to understand the consequences of the proposed changes, making the necessary adjustments to the law prepared without broader consultations and analyses, and to give entrepreneurs time to prepare for these changes.

These three above-described areas of recommendations certainly dominated the economic policy proposals put forward by EFC experts. Among other proposed activities, however, the following can also be distinguished:

- changing the approach to the Covid-19 vaccination policy, introducing solutions that radically increase the inclination of Poles to be vaccinated (e.g. the possibility of participating in public life only for the vaccinated), so that the state of herd immunity can be achieved as soon as possible and further pandemic recurrences are avoided,
- a return to a personnel policy in state administration and State Treasury companies based on competences, not on political ties,
- increasing the stability of regulations in the area of economic law and abandoning the widening of the discretion of state bodies,
- solving the issue of foreign currency housing loans,
- undertaking actions aimed at increasing the professional activity of Poles and adopting a rational immigration policy, which should be one of the key responses to unfavourable demographic trends and the growing shortage of qualified employees.

Reviews

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Paweł Niedziółka, *Green (r)evolution in Polish banking*, Difin, Warsaw 2020

Paweł Niedziółka, professor at the Warsaw School of Economics, is the author of many scientific publications on the functioning of the financial market – from institutional and regulatory issues to practical aspects of trading in financial instruments. As a banking practitioner, he raises in his considerations the issues of current challenges that financial institutions have to face. Therefore, it is not surprising that in his latest book P. Niedziółka deals with current issues related to climate and environmental issues and their relationship with the financial sector, with particular emphasis on the experiences of Polish banking.

In recent years, the topic of sustainable green finance and the impact of climate and environmental factors has been one of the most discussed in financial circles in recent years. This is due to the increasingly tangible impact of global warming and the consequences of the intensive use of non-renewable natural resources on the functioning of economies and societies. Occurring more and more often extreme weather (climate) phenomena become a source of threat also for the financial system. They result not only from the operational risk materialization (e.g. flooding of branches of a financial institution as a result of floods), but also from the materialization of credit and market risk or an increase in insurance liability of financial institutions (these threats concern both insurance companies and other financial institutions that provide financing to entities affected by climate change or natural disasters). Nevertheless, the financial sector, as a provider of capital guaranteeing the implementation of various projects, is also a very good

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agent forcing the transformation of economies towards low-carbon ones, thus contributing to reduction of the negative effects of climate change. The area of climate issues is therefore, in two ways, of particular interest to financial institutions and is part of the trend of popularizing ESG issues (i.e. *environmental, social and corporate governance*) promoting socially responsible business activity (not only by the financial institutions). It should be emphasized that the above-mentioned issues have been in recent years the subject of growing interest not only of financial institutions, their clients and investors, but also of regulators and institutions supervising their activities. It is expected that not only financial institutions will operate in a sustainable manner, but also safety net institutions will take ESG issues into account in their activities (e.g. central banks in their monetary policy or regulators in assessing the risk level of individual financial institutions).

The above clearly indicates the need to develop scientific research on the relationship between climate change and the financial system, as well as the financial institutions impact on the real economy in order to reduce its destructive impact on the environment. Whereas, research in this area for many years has not been the subject of significant interest of scientists. This topic in Polish literature has not yet been fully elaborated, with few exceptions[1]. For this reason, the book by P. Niedziółka belongs to a pioneering trend in national research on the interrelationships of the financial system and climate and environmental changes.

The reviewed monograph consists of 13 chapters, which can be divided into four thematic blocks including:

1) basic theories of economics on the exploitation of the Earth's natural resources (thus indicating the economic justification for the need to take measures to reduce the impact of economic activity on our planet) – chapter 1–2,
2) the most important initiatives and systems aimed at environmental and climate protection (showing the scale and scope of actions taken) – chapters 3–6,
3) the importance of climate and environmental issues for the financial system (by analysing the achievement of goals developed as part of international initiatives in the field of environmental protection presented in the earlier part of the book) – chapters 7–11,
4) conditions for the functioning of the green energy market and the participation of banks in Poland in it – chapters 12–13.

The first block briefly presents the achievements of the economics in terms of resource exhaustion and its consequences (including theories of Malthus, Smith, Ricardo, Solow, Kremer, and Kuznetz). Attention was paid to the theory of externalities (Pigou tax) and the concept of Nordhaus. The inventory of causes and effects of global warming is also discussed in detail. Such problem area delineation

[1] The only exception is the study by M. Zioło, *Balanced Finances. Development. Risk.Market (Finanse zrównoważone. Rozwój. Ryzyko. Rynek)*, Polish Economic Publisher (Polskie Wydawnictwo Ekonomiczne), Warsaw 2020.

definitely makes it easier for the reader to understand the reasons for taking specific initiatives at the international level.

All the most important international agreements and agreements aimed at taking actions to protect the Earth were presented in the second block. On its basis, the reader can learn about the conclusions and decisions developed under the so-called U Thanta report and subsequent climate summits. The Stockholm declaration, the Rome Club report of 1972, the Rio de Janeiro Earth Summit in 1992 and subsequent Conferences of the Parties (COP), as well as the Kyoto Protocol and the Paris Agreement and their consequences for economic operators were mentioned here. The monograph also includes a summary of EU environmental initiatives (directives and regulations), including the currently key document, i.e. the *2030 Climate Target Plan*, which sets the direction and scale of actions taken in the EU to protect the natural environment.

From the stakeholders' of the financial system point of view, the content presented in the third block of chapters, which were *strictly* devoted to the impact of climate risk on the financial system, is of key importance, and vice versa. It is worth emphasizing that this part of the book organizes the key common areas between the financial system and climate risk, scattered in (mainly foreign) literature, including:

- types of risk related to the materialization of environmental and climate risk for the financial system,
- the importance of environmental and climate risk for financial institutions compared to other types of risk based on the results of the latest research,
- synthesizes the consequences of environmental and climate risk from the point of view of banks,
- potential approaches to considering environmental and climate risk in bank management (including ESG).

When analysing the potential impact of environmental and climate risk on the financial system, not only the aspect of a single institution, but also the systemic dimension was taken into account (the impact of environmental and climate risk on financial stability). The initiatives taken by central banks and supervisors, aimed at taking into account climate issues both in the operation of financial safety net institutions, and in the regulations they create, which are a direct incentive for the implementation of expected solutions by financial institutions, were accurately summarized.

After the characteristics of supervisory initiatives, there are also activities undertaken independently by financial institutions, aimed at supporting activities aimed at environmental protection presented (e.g. green banking, bank climate agreements or equatorial principles). In this respect, it is original to present the activities undertaken so far by individual banks in Poland.

What is worth emphasizing, particular emphasis in the author's considerations was placed on the credit policy relating to new projects in the area of renewable energy sources in Poland, in particular financing onshore wind energy and photovoltaics

using the *project finance method.* The last thematic block contains an in-depth analysis of the conditions for crediting green energy in Poland. It indicates both: possible forms of financing green energy in the *project finance formula* and their practical aspects (possible variants and terms of the transaction, accompanying procedural requirements and problem areas). The last block of the monograph is certainly an important source of knowledge and practical tips for people dealing or planning to take up professional financial transactions on the green energy market. It should be emphasized that the issues discussed in this part of the book constitute a skilful combination of theoretical knowledge, the applicable legal framework and the analysis of practice based on the author's own experience.

Summing up, it can be stated that the monograph by P. Niedziółka is a substantively and logically coherent whole, making it easier for the reader to understand the causes of environmental and climate risk, the genesis of currently undertaken actions aimed at reducing it, and also allows to get to know the specifics of the domestic green energy market and the transactions financing green projects on it.

Undoubtedly, the discussed monograph is worth recommending to a wide audience – from representatives of financial safety net institutions, through employees of various bank divisions and other financial institutions involved in the process of financing green energy, to students and supporters of issues related to climate risk.

The monograph of prof. Niedziółki, as one of the first in this respect on the Polish publishing market, should also inspire other representatives of the scientific world to continue and deepen research on the relationship between environmental and climate risk and the financial system.